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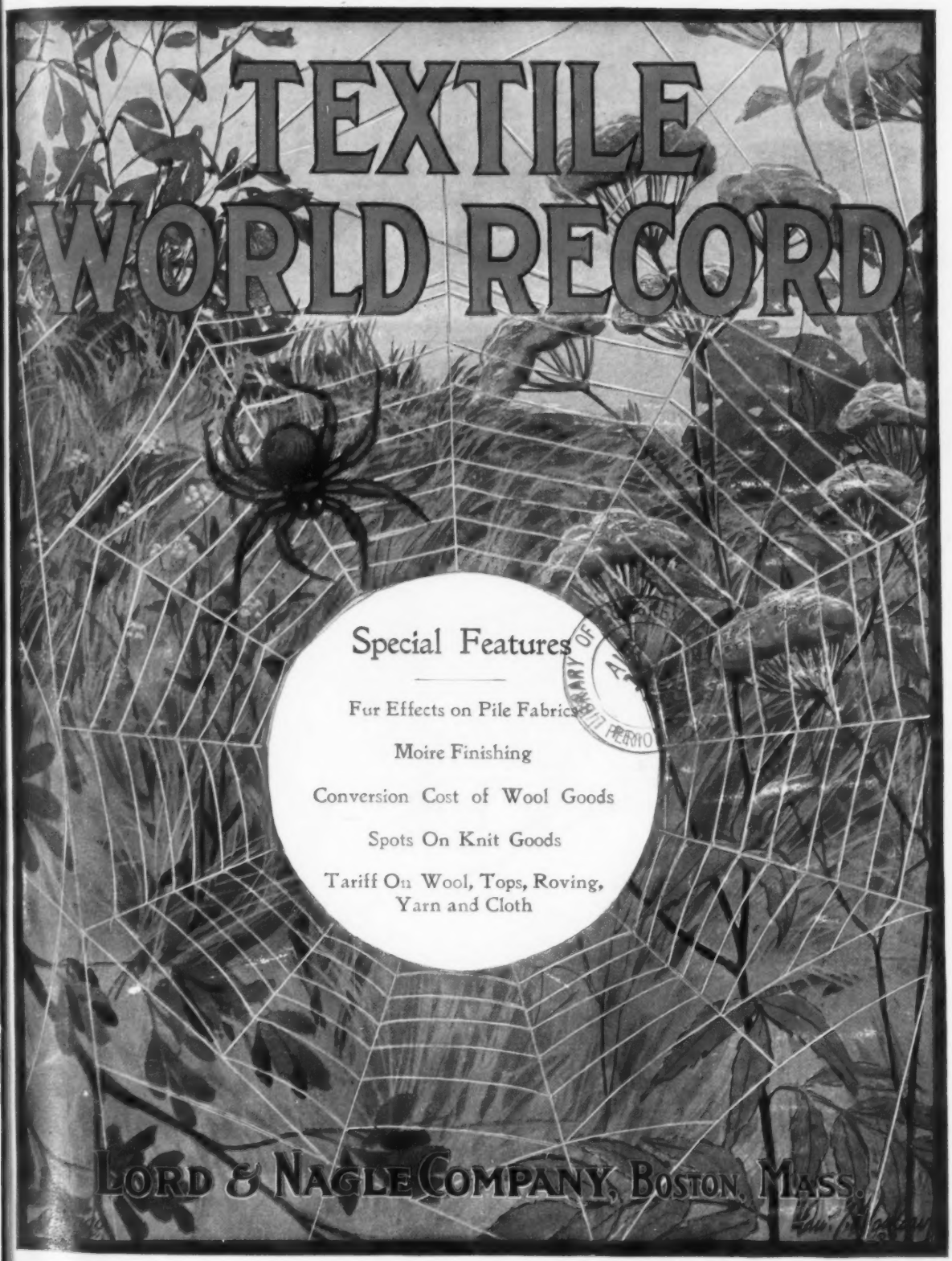

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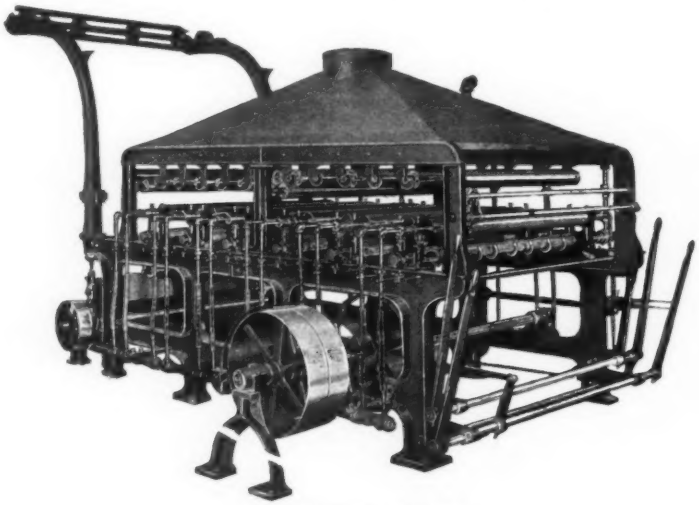

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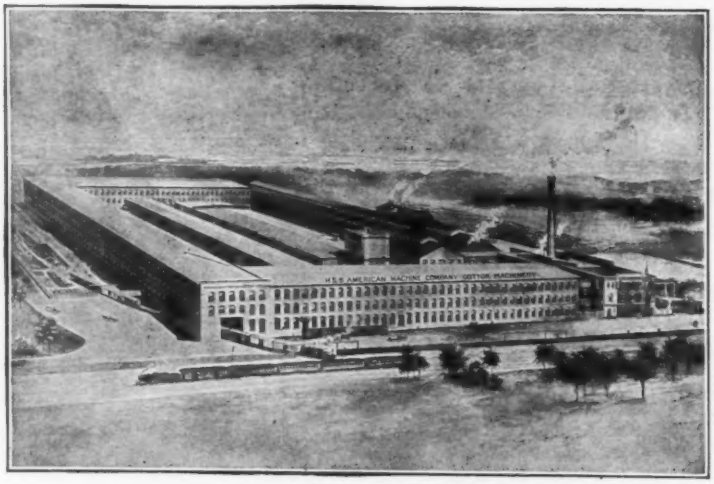
Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

AUGUST, 1913

Monthly Comment.

The Tariff on Wool, Tops, Roving, Yarn and Cloth

The Underwood tariff bill as reported to the Senate by the Finance Committee places a duty of 35 per cent. on wool cloths, 15 per cent. on yarn, and 5 per cent. on roving and tops, while wool is on the free list, whereas the House bill provided for 35 per cent. on cloths, 20 per cent. on yarn and 15 per cent on roving and tops, with wool on the free list. The reductions proposed in the rates on tops, roving and yarn have brought home to all branches of the industry the importance of equalizing tariff rates on partly manufactured products and finished goods. Unless these rates are adjusted fairly, the new tariff will place some manufacturers at a disadvantage, as compared with others, who will enjoy special privileges.

In our May issue we discussed the method of equalizing the tariff on tops, yarn and cloth, and pointed out certain discrepancies between the House rates and rates adjusted to the conversion costs of the respective products. The changes proposed by the Finance Committee are such as to make a second comparison desirable. For this purpose we will take $10,000 worth of worsted cloth made in England, the value of which consists of 60 per cent., or $6,000, for wool, and 40 per cent., or $4,000, for cost of conversion. Continuing the method suggested in May, we will base our examination of the Finance Committee's rates on the statement of labor cost for 4,425 pounds of worsted cloth, which is in substantial agreement with the statement of cost submitted to the Ways and Means Committee by C. Brooks Stevens, treasurer of the U. S. Bunting Co., Lowell, Mass.:

Labor Cost of Conversion

Wool to Tops	$155	11%
Tops to Roving	94	6½
Roving to Yarn	323	22½
Yarn to Cloth	862	60
	$1,434	100%

The total conversion cost of the $10,000 worth of cloth taken for illustration is $4,000. This divided in proportion to the costs of the respective processes gives the following result:

	Wool	Conversion	Total
Tops	$6,000	$440	$6,440
Roving	6,000	700	6,700
Yarn	6,000	1,600	7,600
Cloth	6,000	4,000	10,000

The Underwood duty on the $10,000 worth of worsted cloth is 35 per cent., or $3,500, which, divided in proportion to the costs of the various processes, gives the following duties for the different products:

	Conversion	Duty
Tops	11%	$385
Roving	17½	612
Yarn	40	1,400
Cloth	100	3,500

We have now found the equalized duties and total costs of the different products, and from these the equalized rates are calculated:

	Total cost	Equalized duty	Equalized rate
Tops	$6,440	$385	6%
Roving	6,700	612	9
Yarn	7,600	1,400	18½
Cloth	10,000	3,500	35

The equalized rates and the rates proposed by the Finance Committee are as follows:

	Equalized rate	Fin. Com. rate
Tops	6%	5%
Roving	9	5
Yarn	18½	15
Cloth	35	35

These calculations illustrate the method of adjusting the rates in schedule K so far as partly manufactured and finished goods are concerned. But no schedule of tariff rates is equalized that admits wool free while imposing duties on manufactures of wool. It is necessary to place a duty on wool and equivalent rates on wool goods in order to make the schedule fair to all classes of producers. The rate which the House Ways and Means Committee decided to place on wool, and which in all probability would have been adopted by the House of Representatives if President Wilson had not interfered with the arrangement, was 15 per cent. This rate on the cost ($6,000) of the raw material in the $10,000 worth of goods, amounts to $900. Placing a duty on wool makes it necessary to increase the duty on each manufactured product by an equal amount:

	Cost	Equalized Duty	Equalized Rate
Wool	$6,000	$900	15%
Tops	6,440	1,285	20
Roving	6,700	1,512	22½
Yarn	7,600	2,300	30
Cloth	10,000	4,400	44

The equalized rates and the Finance Committee's rates are as follows:

	Equalized	Fin. Com.
Wool	15%	Free
Tops	20	5
Roving	22½	5
Yarn	30	15
Cloth	44	35

The foregoing calculations are given for the purpose of illustrating the method of equalizing rates on partly manufactured products to conform to a given rate on goods. We have used for this purpose the most accurate data attainable as to the proportionate conversion costs of tops, roving, yarn and cloth. We have based the calculations on a duty of 15 per cent. on wool, the rate originally adopted by the Ways and Means Committee, and 35 per cent. on goods, which has been adopted by both the House and the Finance Committee of the Senate.

While these rates serve as well as any to illustrate the method of equalizing duties on tops, roving, yarn and cloth, we believe that, if they are put into force, they will cause serious injury to legitimate industry before American manufacturers can adjust their business to the new conditions. Whether a rate is too low or too high is a question of judgment on which there can be an honest difference of opinion. Whether too low or too high, there can, however, be no dispute over the proposition that a tariff rate on wool cloth should be fairly apportioned on partly manufactured products so as to place all producers under equal conditions of competition, not only with foreign competitors, but with each other. The Finance Committee's schedule discriminates against the wool grower, whose product is free, and against the worsted drawing and spinning industries, whose products, roving and yarn, are subject to rates proportionately lower than the rate on finished cloth. These inequalities should be corrected in order that, so far as is possible, all producers may be equal under the tariff law and the country may be spared from further agitation over schedule K.

The value of the woolen and worsted goods produced in this country in 1909 amounted to $296,447,594 in 1909; $234,737,036 in 1904, and $183,306,664 in 1899, an increase for the decade of 61.7 per cent.

In 1909 the woolen and worsted goods establishments in this country produced 570,743,797 square yards of woven goods, exclusive of upholstery goods and sundries, compared with 505,821,956 square yards in 1904 and 426,572,856 in 1899, the increase for the decade being 33.8 per cent.

Controlling the World's Cotton Supply

Some time ago a party of Americans, known as the "American Commission to Investigate and Study Agricultural Credit and Cooperation," sailed for Europe where they separated into sub-commissions to take up different branches of the work. One of these, consisting of J. S. Williams and Clarence Ousley, visited Egypt and recently presented to the main commission a report on the production and marketing of Egyptian cotton, which has been made a Senate Document at the request of Senator Fletcher of Florida. This report begins with a statement that "Egyptian cotton cultivation offers no instruction whatever for America in skill, science or other element of economy or efficiency, . . . nor can it be said that the Egyptian producers market their crop to better advantage or even to equal advantage." This is followed by details as to the Egyptian cost of production and methods of conversion and marketing, after which the sub-committee gets down to the really important part of the report under the head, "Cooperation Promised." Under this most of the cotton raised by the Egyptian tenants is sold in advance on contract, a system which meets with the approval of the American sub-commission:

> The method of selling so large a part of the crop under contract, unwise as it appears in many respects, makes for the advantage of the ignorant peasantry, who otherwise would be the victims of commercial greed, which seems to manifest itself everywhere in about the same way under similar opportunities and circumstances.

The contract system is a two-fold blessing. Not only does the contract system protect the ignorant peasantry, but it works to the advantage of the American cotton producers by facilitating cooperation "for the amelioration of prevailing hard conditions among agricultural producers throughout the world":

PICKING COTTON ON THE ABOUKIR ESTATE AT 5 TO 20 CENTS A DAY

> It happens, also, at this time to make for the advantage of the American producers, for the reason that these large proprietors are men of superior ability, and being comparatively few in number can be brought into effective cooperation more quickly than large numbers of small proprietors and tenants in America. We found these proprietors eager to cooperate, and they expressed themselves as cordially sympathetic with the spirit moving the American commission for the amelioration of prevailing hard conditions among agricultural producers throughout the world.

Having thus disclosed the philanthropic

purpose of this Egyptian-American cooperation, the American sub-commission gets down to business:

They (the Egyptian landed proprietors) manifested a keen interest in the undertaking initiated by the American cotton states governors two and a half years ago to obtain reports of cotton consumption in all the cotton-growing countries and pledged their immediate activities to this end. This particular proposal had the cordial approval of the Hon. Gerald C. Dudgeon, the English director general of Egyptian agriculture, who agreed to recommend it at once to Lord Kitchener, the head of the British advisory administration, and who expressed the confident opinion that his lordship would make formal request upon the British ministers of agriculture and commerce to institute a department for reporting cotton consumption.

themselves as a bureau of cotton information, with special reference to consumption and the extended use of cotton goods, and that other cotton-growing countries be invited to have representation in such bureau to the end that intelligent information may be furnished the producers for their guidance in adjusting supply to demand, and that the demand for our great staple product may be stimulated.

Next comes this frank admission that the plan is designed to regulate the price of cotton by keeping it above the cost of production:

We are confident that such a bureau would operate as a practical insurance against either overproduction or underproduction and would maintain the price of cotton above the cost of production and yet prevent abnormally high prices, to the injury and hardship of consumers.

NATIVES SOWING COTTON IN UPPER EGYPT

The report states that Messrs. Williams and Ousley met N. Shakour Pasha, manager of the Egyptian Enterprise and Development Co., and Garbeith Land Co., controlling 50,000 acres of land; R. Lang Anderson, manager of the Abourkir Co., controlling 30,000 acres; Shakour Pasha, of Cairo; Albert Neurisson and other proprietors, representing in the aggregate from 7 1/2 to 10 per cent. of the Egyptian cotton crop. The report says:

We were assured of their immediate earnest action in behalf of cooperation among themselves and with American producers for mutual benefit. We have reason to hope also that Egypt will join in any effort the cotton States may initiate to establish an interstate and international bureau of cotton intelligence for the promotion of more efficient production and more economical marketing. In this connection we earnestly recommend that each of the principal cotton States of the Union create the office of cotton commissioner, and that such commissioners together constitute

Finally the American sub-commission gives this summary of the cooperative scheme that is to help everybody, the miserable Egyptian fellah, the landed proprietor in Egypt and the United States, and the consumers of cotton goods in all parts of the world:

1. Egypt with her 1,500,000 to 2,000,000 bales of cheaply produced but dearly sold cotton admonishes American growers to improve their methods of cultivation and marketing in order to reduce their cost of production.

2. The proprietors of large Egyptian estates representing 7 1/2 to 10 per cent. of the crop are in a position to cooperate and render powerful aid in maintaining fair prices for their commodities and these prices will tend to steady the prices of American cotton if our producers do not commit the folly of producing more than the world will take at profitable values, and if the cotton States will establish a system of State regulated warehouses which will enable the farmers to store their cotton and secure cheap money upon warehouse receipts whereby they may sell the crop

generally over a period of several months instead of forcing it upon the market, as they do now, within two or three months.

3. These proprietors and the British Egyptian department of agriculture promise hearty cooperation in establishing a system of accurate reports of cotton consumption.

Therefore, we repeat that there is a vital relation between Egyptian and American cotton production which should be cultivated in amity and mutuality by every possible official and cooperative endeavor.

Stripped of its non-essentials this plan of cooperation between Egyptian landed proprietors and the American cotton growing interests is the familiar scheme to raise the price of cotton by restricting the supply of that staple in accordance with what a few men arbitrarily determine to be the demand. The only difference is found in the fact that the supporters of this Egypto-American scheme boldly ask that the British and United States governments organize departments for the purpose of promoting the combine. The ridiculous pretense of the landed proprietors in Egypt that they desire to ameliorate the hard conditions among the peasantry deserves no consideration. Restricting the production of cotton will reduce the demand for agricultural labor. This will in turn tend to reduce the wages of the peasants, who, according to the American investigators, show no disposition to cooperate for a reduction in the supply of their labor.

WORKING IN EGYPTIAN COTTON FIELDS AT 15 TO 20 CENTS A DAY

It does not appear probable that the Egyptian peasantry, who are the actual cultivators of the soil, will require higher wages or attain to materially better living in any near period, for they are without keen aspiration and they are multiplying at a greater ration than the increase of production.

What are the wages that keep the Egyptian peasants in a chroinc state of misery? The sub-commission, after showing that Egyptian cotton worth 18 to 20 cents a pound, costs about 12 3/4 cents, answers that question as follows:

It must be understood that the labor herein reckoned is paid at the rate of 15 to 20 cents a day for adults and 5 to 10 cents for children, and the calculation applies to all who are engaged in the work of actually tilling the soil, whether as owners, tenants, or hired workers. Paying the same labor at the cheapest rates paid to unskilled American farm laborers would more than double the expenditure and the cost of producing Egyptian cotton would far exceed the current market price of the commodity. On the other hand, if modern methods of production were used, the present cost could be reduced 25 to 50 per cent. As the case stands, the average tenant or small owner with three or four children cultivates about 8 acres of land of which he plants one-third to one-half in cotton, under more or less intelligent rotation, and the remainder in feed and forage crops. The average yield for Egypt during the last few years may be reckoned at 450 pounds to the acre, so we may say in round figures that the cotton output of the average peasant family, all of whom work at cultivating or at tending the animals or otherwise, is about 1,500 pounds, which at 5 cents a pound profit will make only $75 a year for accumulation or for creature comforts with which the native Egyptian family now has no acquaintance whatever.

That this picture is not overdrawn is confirmed by the following extract from Arno Schmidt's report on cotton growing in Egypt, from which the illustrations are taken, all going to show that the condition

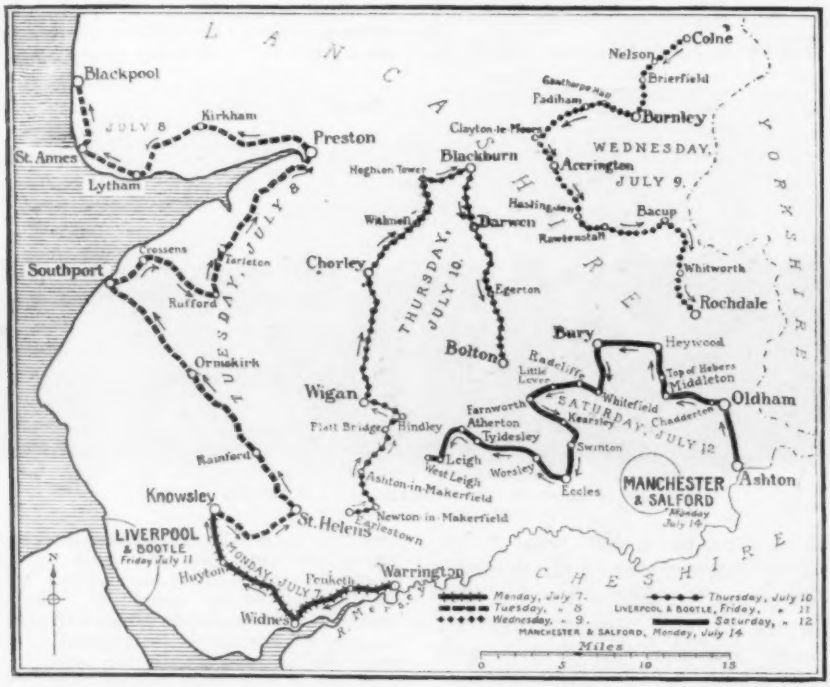
of the peasantry in Egypt is a blot on the world's industrial map:

> In some cases the laborer is paid partly in cash and partly by the landlord giving him an allotment of about 2 to 2 1/2 acres of medium land; for every child he will get an additional half acre. The laborers are under restriction as to the cultivation of this allotment; for these allotments they pay only a reduced rent, supposed to be equal to the land tax. The day wages paid are 1/2 P. T. (2 1/2 cents) for a child; 2 P. T. (10 cents) for a woman, and 3 P. T. to 4 P. T. (15 to 20 cents) for a man. The day is reckoned from sunrise to sunset.

If the Egyptian landowner is so greatly concerned about bettering the living conditions of the peasants, why does he not raise their wages at once instead of scheming to raise arbitrarily the price of cotton throughout the world? The uplift of the Egyptian fellahs is in every way a worthy object, but it is altogether too thin a disguise for a cotton growers' combine to raise prices. It is no part of the business of the government to guarantee prices for any commodity above the cost of production. The appearance of such a scheme in the report of the American sub-commission suggests that the American Commission to Investigate Agricultural Credit and Cooperation itself needs investigation.

Two Kings in Lancashire

Lancashire was honored last month by a visit of the king and queen to that county palatine, the itinerary being shown on the accompanying map. The Lancastrians, young and old, high and low, improved the opportunity to give expression to their unques-



tioned loyalty and affection for the royal family. While there was no mistaking the unanimity of this sentiment of devotion to the head of the nation, King George found at Preston that the people had erected a triumphal arch of cotton bales, under which the royal party passed, thus calling attention to the fact that Lancashire has two kings, one political and British, the other industrial and foreign. By a coincidence the British Board of Trade returns for June, published on the day of the royal visit to Preston, demonstrated the industrial supremacy of King Cotton in Lancashire as the welcome of the

people proved the undisputed sway of King George. For the six months ending June, 1913, the British exports of cotton yarns and piece goods were valued at £56,268,818, or at the rate of £112,537,636 per year. Careful estimates have shown that four-fifths of the products of English cotton mills is exported, and at this rate the exports for the six months named means an annual product of £140,672,045 ($689,293,000).

THE TRIUMPHAL ARCH OF COTTON BALES BUILT BY THE PEOPLE OF PRESTON.

Practically all of this vast quantity of cotton goods is manufactured in the county of Lancashire, which has 55,000,000 cotton spindles, 40 per cent. of the world's total, consuming approximately 4,300,000 bales of cotton annually. There within an area of 1,708 square miles is concentrated a population of 2,869 per square mile, making a total of 4,900,000, or in other words the population of Massachusetts, Maine, New Hampshire and Vermont crowded into an area one-eighth less than that of Delaware. Not an ounce of the raw cotton used in the mills of Lancashire is produced in the United Kingdom. All of it must be imported. Thus, while a part of a politically independent kingdom, Lancashire is industrially dependent on a foreign supply of raw material. The Lancashire cotton trade depends on lands beyond the seas, not only for a supply of raw cotton, but also for a market for her cotton goods. This dependence on foreign markets for cotton goods is aggravated by the large proportion of the trade that is carried on with India, a country in which the demand for a protective tariff against Europe is steadily growing stronger. Of the 615,557,600 yards of cotton piece goods exported from Great Britain during the six months ending June, 1913, India took 43 per cent., while the remainder of Asia absorbed 18 per cent., making 61 per cent. exported to Asiatic markets.

In 1689 Jacques Delure commenced printing at Neuchatel, and the art then soon spread into Germany, Portugal and France.

The Tax on Cotton Futures

The bill introduced by Senator Clarke, of Arkansas, imposing a tax on sales of cotton for future delivery, provides that the tax shall be refunded if the cotton is actually delivered. This rebate provision limits the tax to transactions which are closed, not by the delivery of cotton, but by a purchase to offset the original sale. The bill provides

> That upon each sale, agreement of sale, or agreement to sell, or upon each purchase, agreement of purchase, or agreement to purchase, of any cotton for future delivery at or on any Cotton Exchange, Board of Trade or other similar place, or by any person acting in conformity to the rules and regulations of any such Cotton Exchange, Board of Trade, or other similar place, there is hereby levied a tax equal to one-tenth of one cent per pound on the quantity of cotton mentioned and described in any such contract: Provided, That in all cases where the quantity and kind of cotton mentioned and described in such contract is actually delivered, in compliance in good faith therewith, by the buyer to the seller therein respectively named, the tax levied by this section shall be refunded to the party paying the same, in such manner and under such regulations as the Secretary of the Treasury shall prescribe. Any sale, agreement of sale, or agreement to sell, or any purchase, agreement of purchase, or agreement to purchase, of any cotton for future delivery, at or on any Cotton Exchange, Board of Trade, or other similar place, or by any person acting in conformity to the rules and regulations of any such Cotton Exchange, Board of Trade, or other similar place, in any foreign country, where the order for such sale or purchase has been transmitted from the United States to such foreign country, and either the buyer or the seller described in such contract of sale or purchase, is at the time of the execution thereof a resident of the United States, shall be deemed and considered in all rspects a sale, agreement of sale, or agreement to sell, or a purchase, agreement of purchase, or agreement to purchase, for future delivery, of the cotton described therein within the meaning of this section.

The Clarke bill is opposed on the ground that it would eliminate the hedging facilities afforded by the present system of futures, under which a merchant or manufacturer can protect himself against loss between the time he sells yarn and buys cotton to make it, or a merchant sells cotton to spinners and buys the cotton to fill the order. It is also claimed that the provision imposing the tax on foreign transactions when either the seller or buyer is a resident of the United States and the order to buy or sell has been sent from the United States, places the American trade at a disadvantage because the foreign merchant or manufacturer can hedge on foreign exchanges without paying the tax. To these objections it may be said that the abuses in the American system of cotton exchange trading have been so serious and the managers of the exchanges have been so stubborn in their refusal to inaugurate effective reforms as to make legislation similar to the Clarke bill inevitable. Moreover the abuses at which the Clarke bill is aimed have prevented American manufacturers and merchants from utilizing the exchanges for hedging purposes. The conditions in the New York Cotton Exchange have been so bad as to lead the U. S. Commissioner of Corporations to make the following statement in a report following an exhaustive investigation in 1909:

> It will be seen, therefore, that the objectionable features of cotton contracts noted all have the same tendency, namely, the depression of the future price as compared with the spot price. It should be clearly understood, however, that the real evils are that a false quotation is widely published as the price of a great staple, and that the buyer is forced to take the grades other than middling at false valuations. These abnormal discounts, therefore, instead of being the real evil, are, rather, a symptom of the real evil. . . .
>
> When the future contract ceases faithfully to represent cotton, an exchange becomes little better than a bucket shop. In some respects it becomes worse than a bucket shop. No one claims that a bucket shop influences the price of cotton. Spinners and cotton merchants do not consult bucket shop quotations. They do, however, constantly consult the quotations of the New York Cotton Exchange, with a view to basing their forward commitments in cotton or cotton goods upon them.

In considering the tax of 1/10 cent per pound proposed by the Clarke bill on cotton futures, it should not be forgotten that this tax is designed to correct practices that are now a serious burden on legitimate trade. The tax need not prevent hedging. If it serves to eliminate the abuses of the present system of trading, hedging may be more reliable and more economical under the tax of 1/10 cent per pound than under the present objectionable methods.

The output of hosiery in the United Kingdom for the year 1907 amounted to 14,389,000 dozen pairs.

The Revision of the Textile Schedules.

The Finance Committee has recently published a large number of briefs on the tariff, which were filed during the hearings on the various schedules. We give below extracts from a number of the briefs on the textile schedules.

SCHEDULE I—COTTON MANUFACTURES

In a statement on the cotton yarn schedule, Franklin W. Hobbs, president of the Arlington Mills, Lawrence, Mass., said:

The rates proposed by that bill are not only too low, but also are not graduated properly to take into account the differences in cost between single yarn and the same yarn which has been twisted or otherwise processed.

No rate of duty can put the American manufacturer upon a competitive basis with the foreign manufacturer which does not make the latter pay to the Government an amount at least equivalent to the difference in costs of conversion of the domestic and foreign yarns. Furthermore, the difference in costs of conversion of domestic and foreign yarns grows wider and wider in dollars and cents with each added process of manufacture. Our experience has shown, and we think it is borne out by the report of the Tariff Board on Schedule I, that the English cost of conversion is about two-thirds of the American cost.

To show the impossibility of making an ad valorem rate that will remain satisfactory under varying conditions, let us assume a foreign yarn selling for 50 cents per pound with the rate of duty 20 per cent The duty would then be 10 cents and the duty-paid cost 60 cents, which we will assume is the American selling price. If the foreign price drops to 48 cents for any reason, due to changes affecting the foreign but not the American market, and this would be a slight variation under actual business conditions, the difference between foreign and American prices then would be 12 cents per pound and the required rate 25 per cent. In the same way, if the foreign price advanced to 52 cents the difference would be only 8 cents per pound and the required rate about 15.4 per cent. In other words, the duty required will vary with every variation in prices.

In order to aid your committee in as practical a way as possible, we have collected and tabulated certain facts and data as to our own yarn costs and foreign prices, which we give you herewith. We have given in the following table the actual American conversion costs of making single-combed yarns and putting them on cones for delivery, also the added cost of twisting the same yarns, of mercerizing them, and of gassing and mercerizing them.

AMERICAN CONVERSION COSTS OF COMBED COTTON YARNS, ALL DELIVERED ON CONES.

	Counts.					
	40	50	60	70	80	100
Conversion cost of single yarn	15.9	18.9	21.4	24.6	27.8	35.8
Two-ply yarn cost in excess of single yarn	4.7	5.9	6.5	8.6	10.5	13.7
Two-ply gassed yarn cost in excess of two-ply yarn	2.1	2.7	3.0	3.6	4.1	5.2
Two-ply gassed and mercerized yarn cost in excess of two-ply gassed yarn	7.6	8.2	9.0	10.1	11.1	13.4
Total additional conversion cost for two-ply gassed and mercerized yarn in excess of single yarn	14.4	16.8	18.5	22.3	25.7	32.3
Total conversion cost, covering picking, carding, combing, spinning, twisting, gassing, mercerizing, and cone winding	30.3	35.7	39.9	46.9	53.5	68.1

It will be noted that the total additional conversion cost of twisting, gassing and mercerizing is an additional amount nearly equal to the original conversion cost of making the single yarn, or, in other words, that the conversion cost of the yarn in that condition is nearly double that in the single state. It is clear, therefore, that an added duty is needed on yarns so advanced in processes and costs as compared with the duty on single yarns.

Let us look at the matter from another point of view and consider the added American cost, the added English conversion cost, and the added duty on the same as proposed by the Underwood bill in the case of two-ply gassed and mercerized yarns. Taking the American costs from the preceding table and assuming that the English costs are two-thirds the American, we have:

	Counts.					
	40	50	60	70	80	100
American conversion cost	14.4	16.8	18.5	22.3	25.7	32.3
English conversion cost	9.6	11.2	12.3	14.9	17.1	21.5
Duty on same as proposed by Underwood bill	1.4	2.0	2.5	3.0	3.4	5.4
Added English cost plus duty	11.0	13.2	14.8	17.9	20.5	26.9
Excess of American cost not covered by English cost plus duty proposed	3.4	3.6	3.7	4.4	5.2	5.4

This shows clearly that the rates proposed, if they are right for single yarns, cannot be right for two-ply gassed and mercerized yarns.

The following table gives selling prices of American yarns, of English yarns, and the per cent. on prices of foreign yarns needed to make the difference.

We have taken the counts 40-100, inclusive, as on those we have authoritative foreign and domestic prices and they are counts with the manufacture of which we are familiar in our own business.

TWO-PLY COMBED COTTON YARNS.

(*All prices given in cents per pound.*)

	Counts.					
	40	50	60	70	80	100
American selling price	53.3	58.8	65.7	72.7	82.1	98.5
Foreign selling price	41.0	43.0	47.0	52.0	57.0	69.0
Freight and importing expenses	1.2	1.2	1.2	1.2	1.2	1.2
Price of foreign yarn landed in bond	42.2	44.2	48.2	53.2	58.2	70.2
Difference between American and foreign selling prices, including importing expenses	11.1	14.6	17.5	19.5	23.9	28.3
Per cent on foreign selling price necessary to meet difference	27.1	34.0	37.2	37.5	42.0	41.0
Rates in H. R. 3321 ..... per cent	15.0	17.5	20.0	20.0	20.0	25.0

We realize that on the finer counts the rates shown in the above table to be necessary to meet the difference between English and American prices are higher than the equivalent ad valorem rates now levied by the Payne-Aldrich bill.

William M. Butler, 77 Franklin St., Boston, Mass., presented a long brief in which he called attention to the defective adjustment of the Underwood rates on cotton yarn of different sizes:

It can be safely stated that the great proportion of the fine yarns and fine goods manufacture during the normal condition of business is represented by numbers between 60s and 99s, and yet these 40 numbers, comprising the entire group, are given by the pending bill only 20 per cent. on all kinds of yarns, whether in singles, combed, plied, dyed, bleached, or mercerized, and 22 1/2 per cent. on cloth, both plain and fancy, however expensive the yarn or labor entering into the manufacture.

It is extremely important that this group of 40 numbers should be broken up into at least four groups of 10 numbers each.

Stuart W. Cramer, president of the American Cotton Manufacturers' Association, presented a brief from which the following is taken:

When we first appeared before the House committee, we based our cotton-yarn classifications upon the assumption that yarns were but steps in the manufacture of cotton fabrics. In the discussions and investigations that followed, we realized that for tariff purposes yarns should be regarded as finished products for sale and distribution to the yarn trade, as they come into competition with foreign yarns in the yarn markets.

The percentage of importations of yarns above No. 40 to the domestic production of the same

counts for sale to the yarn trade is 19 per cent., a competitive amount.

We also found that the total domestic production of 78/2 and 80/2 amounted to 2,530,337 pounds, of which 1,361,210 pounds were made in the Northern States and 1,169,127 pounds in the South, and that the importations amounted to over 35 per cent. of the American production. All this is set forth at length in our Tariff Bulletin No. 6, copy of which is herewith appended.

Hence, our suggestions embodied rates based upon 78/2 as a competitive or contact point, and a proportionate reduction on the lower numbers.

When we approached your committee after the introduction of the new tariff bill, H. R. 3321, which embodied similar grouping by numbers to those suggested by us, we did not sufficiently emphasize the importance of the distinction, although we did point it out.

And so, in our several representations to you, we have not treated the subject broadly, as we should have done, but contented ourselves with endeavoring to get such modifications of the rates and classifications as would smooth out their inequalities and bring them to a parity with the cloth rates.

The open-mindedness and keen insight into its contradictions shown by your committee during the several discussions has both brought out and brought home to us the fact that you would likely favor a clean-cut piece of work rather than patchwork, even though it requires new classifications, provided the basis is low enough to meet your views and the classifications are warranted by the facts.

We therefore wish to submit an amendment that will change the groupings, but which accepts as its basis the gray carded single yarn rates of H. R. 3321, with trifling modifications that will not affect over 3 to 4 per cent. of the production of those yarns.

The revised rates submitted by Mr. Cramer show a uniform increase of 2 1/2 per cent. at intervals of ten yarn numbers, thus removing the irregularities of the Parker and Underwood schedules and bringing the rates nearer to the progressive adjustment of 1/4 per cent. per yarn number:

Reclassified as above, H. R. 3321 rates on all yarns becomes: Nos. 1 to 9, 5 per cent.; Nos. 10 to 19, 7 1/2; Nos. 20 to 29, 10; Nos. 30 to 39, 12 1/2; Nos. 40 to 49, 15; Nos. 50 to 59, 17 1/2; Nos. 60 to 69, 20; Nos. 70 to 79, 22 1/2; Nos. 80 to 89, 25; Nos. 90 to 99, 27 1/2; No. 100 and above, 30 per cent.

Mr. Cramer said:

Frankly, we cannot indorse those rates, as we think more importations will be made under them than Congress intends if they are adopted, for we understand that only competitive rates are sought, and we believe these reductions go further than that; we only adopt them, and are willing to try them cheerfully and in good faith in the belief that corrective legislation will be forthcoming in case importations exceed what you expect.

While groupings by 10 numbers is both close enough to suit the trade and not elaborate and complex of administration, evidently the line of division should not come just under the numbers most in demand or there will be a repetition of the present situation as to bringing in 78s for 80s, and it will be on a much larger scale. So we suggest the dividing line for the groups at a point halfway between those numbers mostly in demand; the groups will then divide at 5, 15, 25, 35, 45, 55, 65, 75, 85, etc. That will enforce the intent of the bill, for customers would not accept as substitutes yarns five or six numbers lower than their requirements

H. R. 3321 modified as thus outlined would contain yarn rates as follows: Nos. 1 to 4, 5 per cent.; Nos. 5 to 14, 7 1/2; Nos. 15 to 24, 10; Nos. 25 to 34, 12 1/2; Nos. 35 to 44, 15; Nos. 45 to 54, 17 1/2; Nos. 55 to 64, 20; Nos. 65 to 74, 22 1/2; Nos. 75 to 84, 25; Nos. 85 to 94, 27 1/2; No. 95 and above, 30 per cent.

The various difficulties which Mr. Cramer seeks to obviate by moving the dividing lines would disappear if the progressive adjustment to each additional yarn number were adopted. This would not make the administration of the law any more difficult, because the yarn count must be determined regardless of whether the step-ladder or progressive method is adopted.

The New England Cotton Yarn Co. presented a brief in which the following statement appeared:

Your petitioner has about 100,000 spindles which are applicable to yarns Nos. 80 and above.

Attention is called to the fact that the House bill 3321, paragraph 255, does not afford sufficient protection for fine yarns.

It is submitted that above 60s all yarns should receive an additional 2 1/2 per cent. duty, but even if this concession cannot logically be accorded, then your petitioner urges with what force it can that it is not logical to subject to the same rate of duty yarns from Nos. 59 to 99.

There should be a subdivision of these numbers, and it is suggested that the break be made at No. 79, the duty being 20 per cent. from Nos. 59 to 79 and 22 1/2 per cent. from Nos. 79 to 99 or 100. A table is herein inserted giving the labor in the costs of numbers of yarns from 30 to 120.

30s	$0.0498	70s	$0.1141
40s	.0613	80s	.1290
50s	.0807	100s	.1705
60s	.0986	120s	.2066

Reference to the above shows that No. 60s can be made with a labor cost of less than 10 cents; 80s with a labor cost of practically 13 cents; and 100s with a labor cost of 17 cents.

The Independent Cotton Manufacturers of New England, Simeon B. Chase, chairman, also objected to the Underwood adjustment

of rates, and asked for a regular progression of 2 1/2 per cent. at intervals of ten yarn numbers:

Object of the Foregoing Changes (Cloth): (a) To simplify rates and make them more uniform.

(b) To slightly split up some of the rates made, obviously in error in framing the bill; that made, for instance, only one rate on cloths containing yarns from 20s to 39s, a spread of 20 numbers, while the preceding and following changes up to 60s are 10 numbers each, thus making all numbers evenly rated from No. 1 to 60 take proportionate rates.

(c) We apply the same method of subdividing rates above No. 60 yarns at a change for each 10 yarn numbers, which will operate more equitably for different grades of cloth manufactured, and thereby not ruin the new fine-yarn goods business developed in the last 10 years.

1. The yarn content in cloth should be established by a provision in the law and not ascertained by regulations to be prescribed by the Secretary of the Treasury, because the question of rates depends upon an accurate decision of yarn content.

2. The numbers of yarns in cotton cloth should be determined by Government test at nearest port of entry, where there should be provided a testing room conducted at the same degree of temperature the year round for tests.

4. A provision should be added and written into the law to avoid controversy, that—

"The yarn found in cloth as imported shall be the basis for assessing duties, but when sizing or foreign substance has been added to increase weight more than 1 per cent. the cloth shall be boiled off and such foreign substance removed before determining the yarn content."

This in conjunction with the foregoing suggestions will obviate thousands of technical protests being raised on infinitesimal grounds.

F. B. Gordon, Columbus, Ga., president of the Cotton Manufacturers' Association of Georgia, feared the effect of the tariff on the export trade:

Effect of Underwood Tariff Bill on Southern Export Sheetings: A number of the most important cotton mills in Georgia and the Carolinas make gray goods, which are largely exported to China and other foreign countries. These are known to the trade as brown sheetings and drills, the sheetings weighing 285 3/4 yards to the pound.

In the tariff discussions and hearings little has been said as to the effect of pending legislation on the export business of southern mills. Granted that the effect of the proposed duties on these goods will not be felt as quickly and directly as will the rates proposed on cloths made of higher count yarns, yet the fact that it is supposed that this export business on coarse sheetings will be immune from the generally disastrous effects of the proposed rates will be the very reason why many mills on finer goods will turn to the manufacture of the heavier goods as a possible solution of unprofitable business from European competition on the higher classes of cloth.

J. O. Terrell, of San Antonio, Tex., advocated a duty on wool in order to protect the cotton grower. He closed his brief by pointing to an example of Southern inconsistency:

These are questions that ought to be earnestly considered by the southern farmer. He is doing everything he can to remove the tariff on wool or to reduce it so low that it will not protect the cotton which he raises. He is voting constantly directly against his own interests. Practically every Member of Congress from the South is doing his utmost to reduce the tariff on wool, and thereby reduce the price of the South's own and chief production. Perhaps someone will answer this by saying that the people of the South are opposed to the tariff on principle, regardless of whether it hurts them or helps them. To this I answer that a people whose governors gather together to form a trust to increase the price of the commodity which they have to sell, while condemning in bitter terms all others who form trusts to increase the price of what they have to buy, are not particularly worrying about abstract principles when discussing questions of bread and meat.

SCHEDULE K—WOOL AND WOOL GOODS

William Whitman, Boston, Mass., submitted a sworn statement on June 4 in addition to the one published in part in our June issue. The later brief took up the cost of converting wool into tops, tops into yarn, yarn into cloth, and cotton into yarn. It gave no figures showing the cost per unit of production for each process or the proportion that the conversion cost of each process bears to the total cost of converting wool or cotton into yarn or finished cloth. While these statistics, which would have been of great value in adjusting the rates on tops, yarn and cloth, were omitted, the brief did contain a very interesting statement of the effect of reduced production on the conversion cost in each department. Following is an abstract of the exhibit, the comparison being based on a full production taken as 100 per cent.:

Conversion costs of making tops based on full-time production of 350,000 pounds of tops per week. Conversion costs of making worsted yarns based on full-time production of 175,000 pounds of 2/30s per week. Conversion costs per yard of weaving worsted cloth based on a full-time production of 300,000 yards of cloth per week. Conversion costs of dyeing and finishing based on same production. Conversion costs of making cotton yarn based on full-time production of 75,000 pounds per week of 2/30s combed yarn.

PRODUCTION.

	Full	¾	½	¼
Top making	100	110.9	132.4	196.5
Worsted spinning	100	106.4	119.1	157.4
Worsted cloth weaving	100	114.8	136.7	192.1
Worsted cloth, dyeing and finishing	100	119.5	139.2	170.7
Cotton spinning	100	113.2	140.0	219.0

These figures are of great interest as showing the effect of fluctuations in production on the cost of manufacturing. Mr. Whitman adds:

The foregoing figures show the astonishing rapidity with which the cost of conversion in each process of manufacture increases as a mill decreases its production because of the impossibility of reducing plant and fixed charges, and illustrate the enormous disadvantage under which home manufacturers will labor when their market and by necessary and inevitable consequence their production are curtailed by the displacement of their own goods just in proportion as increasing foreign importations supplant them. They further show the extreme danger of establishing rates of duty otherwise than upon an average production which can be constantly maintained and the marked unfairness of telling the home manufacturer that he must at his peril compete with the foreigner, and at the same time increasing his conversion cost by taking away part of his market, thereby depriving him of his opportunity to run full. No further argument would seem to be necessary to show the imperative necessity of a margin of safety in rates of duty which will cover such inevitable and uncontrollable fluctuations in conversion costs.

Mr. Whitman compares English prices for worsted yarn plus the Underwood duties with the American prices for corresponding grades. We have substituted 15 per cent. for the 20 per cent. rate owing to the reduction made by the Finance Committee after the brief was submitted:

The following table gives the English selling prices of various worsted yarns and the prices of the same yarns made in the United States with free wool. The American selling prices have been figured on a free-wool basis with 5 per cent. added to cover selling expenses and cash discount and 5 per cent. for profit. I believe that this percentage of profit is lower than that which the English manufacturer gets.

As foreign yarns contain 3 per cent. more mois-

PRICES, IN CENTS PER POUND, OF CERTAIN ENGLISH AND AMERICAN TWO-PLY YARNS DELIVERED IN SKEINS.

(Prices based on free wool and a duty of 15 per cent ad valorem on yarn.)

	Counts.				
	2-16	2-22	2-32	2-40	2-60
	Kind and grade of wool used.				
	36s cross bred	36s cross bred	46s cross bred	60s merino	70s merino
English selling price	39.00	40.80	47.50	79.50	89.75
Difference in condition, 3 per cent.	1.17	1.22	1.43	2.39	2.69
Freight and importing expenses	2.50	2.50	2.50	2.50	2.50
Price landed in Boston in bond	42.67	44.52	51.43	84.39	94.94
Duty at 15 per cent ad valorem	5.85	6.12	7.13	11.93	13.46
Landed in Boston, duty paid	48.52	50.64	58.56	96.32	108.40
Estimated American selling price on free wool basis	55.00	58.50	69.00	112.00	129.00
Difference between American selling price, and English selling prices landed in Boston in bond	12.33	13.98	17.57	27.61	34.06
Per cent on English selling price necessary to meet difference	31.62	34.26	36.98	34.73	37.95
Proposed duty, per cent	15	15	15	15	15

ture than the same yarns in this country (owing to difference in climatic conditions), the foreign yarns when imported lose this 3 per cent. in weight by drying out to that extent. Since the weight of the English yarns shrinks this amount from the weight charged, it is necessary to add 3 per cent. to the foreign price to establish a fair basis for comparison.

The other item added to the English selling price of "freight and importing expenses" includes buying commission, freight, interest, insurance, bankers' commission, and bagging. This, of course, varies slightly with different prices of yarns and different conditions, but we have taken an average price of 2 1/2 cents, which is as near as can be estimated.

The figures in this table show beyond question that the rate proposed on worsted yarns, namely, 15 per cent. ad valorem, would be utterly inadequate to establish a living basis of competition and would prove ruinous to the American spinner of worsted yarn. The rates necessary to put the American spinner on a competitive equality with the Englishman are shown to run from 31.62 per cent. to 37.95 per cent., depending on the value and kind of yarn, as compared with the single flat rate of 15 per cent. fixed by the proposed bill.

If the assumption is correct that foreign yarn contains 3 per cent. more moisture than American yarn, the allowance is equivalent to reducing the weight from one standard to another, as, for example, reducing kilograms to pounds. Assuming such a difference in commercial weights of foreign and domestic yarns, if foreign and American yarn were bought without making the allowance, the result would be to decrease the actual protection by a corresponding amount, as we pointed out in our May issue. The remedy, of course, is to buy both foreign and American yarn on the basis of a standard allowance for moisture. The standard established abroad for worsted yarn is 18 1/4 per cent. added to the dry weight. No standard is established in this country, and before one is accepted a careful investigation of climatic conditions in the United States should be made. Such an investigation might show that the foreign standard of 18 1/4 per cent. is as well suited for the United States as for Europe, this obviating the necessity of making an allowance for a difference in standards of condition for every purchase of foreign yarn.

Following the comparison of foreign and American prices for worsted yarn Mr. Whitman gives two tables, one showing the American cost of converting wool into worsted yarn of different counts, and the other comparing the American conversion costs with one-half of such costs (which is assumed to be the English cost) plus the Underwood duty. Following is this portion of the brief with 15 per cent. substituted for the House rate of 20 per cent.:

The following tables give the actual American conversion cost of making single worsted yarns delivered on spinning bobbins, additional cost for the two-ply yarns, and the total conversion cost of two-ply worsted yarns delivered in skeins, the conversion cost being only that in the spinning mill and not including the cost of making tops:

It will be seen at once that the additional conversion cost beyond the single yarn for each count is more than 50 per cent. of the conversion cost in the single state, and that an added duty is needed on yarn so advanced in process and costs as compared with the rate on single yarn.

	Counts.				
	15	20	30	40	60
Conversion cost of single worsted yarns delivered on spinning bobbins	6.95	8.87	10.92	14.14	22.09
Additional conversion cost for two-ply worsted yarns delivered in skeins	3.70	4.65	6.52	8.58	12.83
Total conversion cost of two-ply worsted yarns delivered in skeins	10.65	13.52	17.44	22.72	34.92

Let us, however, consider the question from a different point of view and compare the American conversion cost, the English conversion cost and the duty on the same, as proposed by the Underwood bill. Taking the American cost from the preceding table and assuming the English costs are one-half of the American, we have:

	Counts.				
	15	20	30	40	60
American conversion cost	10.65	13.52	17.44	22.72	34.92
English conversion cost	5.33	6.76	8.72	11.36	17.46
Duty on same as proposed	.80	1.01	1.30	1.70	2.62
English cost plus duty	6.13	7.77	10.02	13.06	20.08
Excess of American cost above English cost plus duty proposed	4.52	5.75	7.42	9.66	14.84

The above table shows that if the flat rate of 15 per cent. ad valorem is right for single yarns it cannot be right for two-ply yarns, and that, as a matter of fact, the domestic manufacturer would be seriously handicapped by such a flat rate, and the greater the conversion cost the more serious his situation would be.

I believe that these tables show clearly the need of additional and graded rates if all spinners are to be put on a fair and equitable basis. The constantly increasing conversion cost as the numbers grow finer, and the fact that this conversion cost increases twice as fast in this country as in England, make plain the necessity for a difference in the rate to take care of this increasing difference in conversion costs.

Mr. Whitman's brief contains the following reference to worsted cloths:

The same principle of relatively greater increase in conversion costs applies equally to the cost of finished cloth or other goods; but I shall content myself with stating most emphatically that even the adoption of the rates of the act of 1894 will surely result in the American manufacturers being forced to give up the manufacture of many classes of goods, thereby leaving the market for such goods exclusively to the foreigner. This will inevitably be true as to light-weight fabrics, in which the cost of conversion is so much higher relatively than the cost of material as to require a rate of duty in excess of 50 per cent. To illustrate this, I beg leave to call to your attention an actual specific cloth which has recently come to my knowledge.

A fabric weighing 1.3/4 ounces to the square yard has been imported into this country in large quantities under existing rates. The American and foreign costs are as follows:

	Foreign.	American.
	Cents.	*Cents.*
Price per running yard	14.17	29.8
Add for importing expenses	.992	
	15.162	
Add duty, 35 per cent of 14.17 cents	4.959	
Duty-paid foreign cost	20.121	

This is an example of a real and not an imaginary cloth. It represents an extreme case, however, in being a cloth in which the conversion cost is relatively very high, and one which cannot probably be made in this country to advantage. I do not, therefore, put it before your committee with the slightest idea of suggesting it as a basis for fixing a rate of duty, but merely for the purpose of showing that a reduction of rates beyond those fixed in the act of 1894 is unnecessary in order to permit the importation of foreign goods which cannot be made in this country except at too great a relative disadvantage.

Mr. Whitman refers to the difficulty of obtaining information as to foreign cost of production:

You will perhaps understand the extreme difficulty of obtaining authentic information as to the details of foreign costs which are so jealously guarded. I have endeavored to furnish you with such information as I have been able to. The most available source for obtaining authentic information as to foreign imports is the declarations of value by importers to our customs department.

The brief closes with this recommendation rates of the Wilson bill of 1894 be reenacted:

In conclusion, let me reaffirm my oral recommendation to you through your subcommittee that the rates of the Wilson Act of 1894 be reenacted. While I believe those rates to be too low, particularly on goods weighing under 4 ounces, as shown by the increase in importations in such light weight goods under that Act, yet I am willing as stated to you orally, to take my share of the risks which will result therefrom. Conditions

were unfavorable for the enactment of the Wilson bill and are more favorable now. How much more favorable, no one can tell until the new rates are actually in operation.

The National Association of Wool Manufacturers presented a brief signed by its secretary, Winthrop L. Marvin, advocating free alpaca:

On behalf of manufacturers using alpaca as a raw material, I respectfully urge that these proposed rates on manufacturers are inadequate to safeguard the American industry, and that alpaca be placed upon the free list. The alpaca is native to Peru and adjacent countries, and, unlike the Angora goat, producing mohair, has never been domesticated in the United States. Our entire supply of alpaca must therefore be imported and the placing of a duty upon it inevitably increases the cost of the material without the slightest pretense of any advantage to any industry in this country.

SCHEDULE L—SILK GOODS

The American Silk Spinning Co., 17 Madison Ave., New York, protested against the proposed duties of 15 per cent. on combed silk and 35 per cent. on spun silk for the following reasons:

1. The proposed change would only redound to the benefit of the Japanese producer. The Government could not collect. 2. Japan only benefited. 3. Industry crippled. 4. Government revenues reduced. 5. Possible complications with Japanese Government.

The Champlain Silk Mills, Brooklyn, N. Y., also filed a protest against the proposed rates on carded or combed silk and spun silk:

Foreign trusts and spinners would absolutely control both the value of the carded and combed silk and its supply and in all probability the manufacture of yarns on this side. This because 65 per cent. of the output of the world's yarns (therefore carded and combed silk) is produced by three concerns known as the "Dreibund." The names of these concerns are:

Societe Anonyme de Filatures de Schappe, Lyons, France, assets over 42,000,000 francs.

Industrie Gesellschaft fur Schappe, Basle, Switzerland, assets over 42,000,000 francs.

Societa Filatura dei Cascami, Milan, Italy, assets over 27,000 000 francs.

These companies have assets of about $25,000,000 and absolutely control the spun-silk business in Europe. While separate concerns, they are as one.

These firms have a working arrangement for the purchase of raw material.

Have a working arrangement regulating the price of yarns.

Have a clear understanding as to the manner in which it will increase or will not increase their plant, and have in the past, when purchasing plants of competitors, divided them equally.

This arrangement has been in existence prior to 1909 to our positive knowledge. In this country, this "Dreibund," as it is known in Europe, would be called a trust, and its operations would be in violation of the Sherman antitrust law. Were it not for the American spinners, the American users of spun silk would be at their mercy, and we know there are many farsighted American weavers who patronize and encourage the American spinner, understanding what a protection against the European trust the American producer of spun silk is. Those weavers who really understand the situation are not anxious for the destruction of the American silk spinners, who are essential to the American weavers' welfare.

Japan is a grave menace.

If carded and combed silk is to come into this country, it will come mostly from Japan, as the spinners of this country are the only ones who produce more carded and combed silk than they spin themselves.

Cheney Bros., South Manchester, Conn., filed a brief in which the paragraphs of the silk schedule in the House bill were considered separately:

The bill changes all of the specific rates on silk goods, which have been worked out by careful study and experiment over a period of 20 years, back to straight ad valorem rates, on a lower basis than even the Wilson bill placed upon these products.

Paragraph 323, page 77, combed silk.—The specific rate of 35 cents per pound is changed to 15 per cent. ad valorem. We believe this change to be very unjust, because it will result in putting the man who has a completely equipped plant for manufacturing spun silks at a distinct disadvantage over the man who has no plant at all.

In the same paragraph, 323, silk noils are introduced at 15 per cent. ad valorem. Silk noils have heretofore been classified as silk waste and introduced free of duty where such noils had an average fiber length of less than 2 inches. They do not think that anybody has asked for a duty upon silk noils.

Paragraph 324.—Spun silk or schappe silk, converts specific rates with a catch-all clause to straight 35 per cent. ad valorem. The examiners of the custom house have themselves confessed to being unable to identify spun silks when the marks of the importers are removed, and for an ad valorem classification it would be necessary for them to accept the invoices of the importer as correct.

Paragraph 325.—Thrown silk, singles, trams, organzine, sewings, etc., 15 per cent. ad valorem in place of specific rates which amounted to between 20 and 25 per cent. There is no person in the United States competent to classify thrown silk of any kind as to value, and it ranges in value all the way from $1.50 a pound for some silks in the gum to $9 or $10 a pound for certain thrown silks in the dyed state.

Paragraph 327.—Handkerchiefs or mufflers,

composed wholly or in chief value of silk, if cut, not hemmed, 40 per cent. ad valorem, practically means turning over all of the handkerchief business of the United States to Japan.

Paragraph 328.—Ribbons, including hat bands, beltings, etc., 40 per cent. ad valorem, a reduction from 50 per cent. This rate we believe to be neither logical nor just. Ribbons have the largest percentage of labor of any woven goods; as an average they being about 66 per cent. labor and about 33 per cent. materials.

Paragraph 330.—Woven goods in the piece, etc., 45 per cent. ad valorem, abolishes a system of specific rates on the most important paragraph of the schedule, which has been gradually and very carefully and scientifically worked out over a long period of years. The goods under this paragraph are particularly difficult to assess for value. Their value is purely a matter of opinion. There is no question that the course here adopted will involve the Government in endless litigation; will lose its immense revenues through undervaluation; and will also cause the importers, who endeavor to conduct their business honestly, many annoyances and difficulties, and will operate very inequitably to the advantage of the unscrupulous.

Asiatic Labor: All parties have agreed to protect American workmen against Asiatic labor. The silk business is the only American industry that comes in really close competition with imports from China and Japan, of which countries the silk industry is the chief industry and is highly developed and efficient, with best modern machinery.

The Catoir Silk Co., 257 Fourth Ave., New York, filed a protest against the House rates on silk goods:

France has been driven out of her own market for the manufacture of cheap and moderate priced piece dyed and printed goods by the Chinese and Japanese. At the present time most of such goods which are shipped from France to foreign countries are woven in China or Japan and shipped by them to France, where they are dyed, printed, embossed, or otherwise converted and are then shipped from France to foreign countries as French goods.

There has been an effort made on behalf of the weavers of such goods to revive their business in France and to secure protection from the French Government in the form of customs duties to enable them to again build up a business. Only this last year the French Chamber of Deputies referred this matter to a commission who definitely reported against it because, as they said, the converting of Chinese and Japanese goods and selling them to the rest of the world was of more value to France than the weaving of these goods could be made to be, as, in their opinion, if the importation from China and Japan were stopped the converting industry would go to Germany or elsewhere and France would not be then able to compete in the markets of the world with goods produced by herself against Chinese and Japanese goods converted in Germany or elsewhere.

In the question of the United States there is no possibility of our exporting to other countries in the same way as it is done by France. The loss of our weaving industry would also mean the loss of our converting industry, and it would not be possible for us to develop such a business as France has done.

It is probable that ad valorem duties upon such goods will allow the importation of large quantities of Chinese and Japanese goods into the United States, which may be converted here for home consumption, abolishing a large portion of the weaving industry without the possibility of our creating an export business as a compensating advantage.

The French weavers were unsuccessful and France has decided to keep her converting industry. How, then, under ad valorem duties are our customs inspectors to determine whether dyed and printed goods are the whole manufacture of Europe or Asia or part of one and part of the other? The same woven fabric would in each case when converted have three different values.

In justice to all concerned, both importers and manufacturers, we would much prefer that the duties be figured on both a specific and ad valorem rate as under the present tariff.

Chemnitz Trade with the United States

The American consul at Chemnitz has issued the following comparative statement of exports of gloves, hosiery and underwear from the Chemnitz district to the United States for the six months ending July 13 for the years 1912 and 1913:

	Gloves	Hosiery	Underwear
Cotton, 1912:			
Quantity, doz.	535,911	1,222,302	8,926
Value per doz. ...	$1.54	$1.18	$3.00
Total value ...	$827,385	$1,439,075	$26,822
1913:			
Quantity, doz.	660,148	989,505	5,903
Value per doz. ...	$1.54	$1.22	$3.07
Total value ..	$1,015,876	$1,211,607	$18,136
Silk, 1912:			
Quantity, doz.	8,785	21,955	663
Value per doz. ...	$2.60	$1.43	$11.77
Total value ...	$22,917	$31,489	$7,808
1913:			
Quantity, doz.	5,149	16,602	585
Value per doz. ...	$2.50	$1.58	$8.12
Total value ...	$12,918	$26,299	$4,752
Wool, 1912:			
Quantity, doz. .. .	24,491	3,551	675
Value per doz. ...	$1.19	$1.77	$3.11
Total value ...	$28,148	$6,319	$2,115
1913:			
Quantity, doz. ...	23,208	3,244	606
Value per doz. ...	$1.22	$1.45	$4.50
Total value ...	$28,498	$4,733	$2,727

THE COTTON TRADE IN AUSTRIA

From Our Special Correspondent

Basel, Switzerland, June 23, 1913.

Editor Textile World Record:

Under ordinary conditions Austrian spinners do not and cannot sell in Germany. The custom house rates are prohibitive and generally speaking the yarn and cloth prices ruling in Austria are higher than those in Germany owing to the greater distance of spinning mills from sea ports, higher taxes and dearer money. However, when the Balkan war broke out the Austrian cotton industry had to face quite a new and unprecedented situation. Austria has no export market of any importance only in the Balkan States. All these outlets were blocked through the war and the Austrians had to find new markets. They formed a syndicate. Those spinners who were located near the frontier or whose production was especially suited for the German market had to sell right away and to export at any price. In fact they sold in Germany franco weaving or converters charges, carriage, cases and duty paid, about 1/4 to 1/2 or 1 to 2 pf. per kilo below German prices and cloth about 1/4 to 1 pf. per meter cheaper. This meant a serious loss, but the exporting firms were indemnified by the other members, the loss being distributed according to the number of spindles and looms of the members of the syndicate.

About 6 1/2 million kilos were thus sold in a short space. German spinners who felt the competition of this foreign yarn very keenly, approached the Government and asked the frontiers to be closed or the taxes to be raised, but of course without avail. Exact export statistics have not yet been published. At present all these exports have ceased. We do not even get quotations from Austrian spinners since peace has been made and Roumania is now taking such quantities of Austrian yarn and cloth that it is far more profitable for Austria to export to these countries than to force their surplus on the German market.

The prices actually paid per pound are:

36 warp ..... 22-23 cts.
42 weft ..... 22½-23¼cts.
20/20 warp ..... 19-19½cts.

All franco weaving mill, with 2 per cent. discount and payable in 30 days after date of invoice. Empty wooden cases to be returned to the spinning mill.

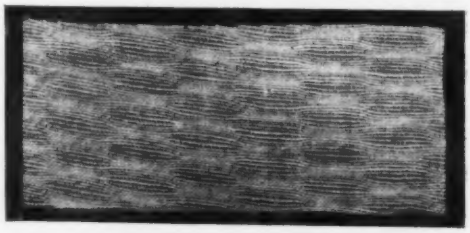
A. Waibel.

UNDULATING WEAVE EFFECTS

Rouen, France, July 3, 1913.

Editor Textile World Record:

I see in your June issue an article on "Undulating Weave Effects." I take the opportunity to enclose a few clips of various cloths which are produced, not by a reed, but in the weave by a device invented and patented by



AN UNDULATING WEAVE EFFECT.

an Englishman who solicited me to try to sell the patent. If it interests your correspondent I shall be pleased to put him in touch with the inventor.

Yours faithfully,

James Hope.

The samples enclosed with Mr. Hope's letter can be seen at our Boston office or will be sent on application to anyone interested. One of the patterns is shown in the accompanying illustration.

THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

The 95th meeting of this association will be held at Atlantic City, New Jersey, on October 1 and 2, 1913. Arrangements are being made for special transportation from the New England States, New York, and Philadelphia.

CONVERSION COST OF WOOL GOODS

BY WESSEX

It cannot be called surprising that some difference of opinion should be discovered as to the relative importance of raw material cost and manufacturing cost in the final price of woolen and worsted yarn and cloth. The blunt question whether the cost of conversion is greater in high-priced or in low-priced goods admits in good faith of entirely contrary replies and the queston cannot be satisfactorily answered until it has been refined a good deal. Costs of conversion irrefutably do increase as raw material is carried from a low to a highly manufactured state and nobody would think of denying so demonstrable a fact. Evidence on the point is unnecessary, but if it were wanted records could be adduced to show that in a representative dressgoods mill in Bradford the wage bill was found to be thus apportioned:

Sorting .....per cent.	6
Combing	6
Spinning	18
Weaving, etc.	70
Per cent. 100	

In the case of another mill in the same trade the element of raw material was found to be as follows in the cost of the several products at their different stages of manufacture.

Sorted Wool .....per cent.	95.6
Tops	84.6
Yarn	64.1
Cloth	34.1

Conversion costs increase with the progress of the operations and the percentage represented by raw material correspondingly dwindles. But there are both fixed and loose factors in the composition of an ultimate cost and of the variable factors the most conspicuous one is the value of wool. There are extreme differences between wool of one grade and another and differences similarly great in the value of the same wool at different points of time. Conversion costs were practically the same in 1898 as in 1900, but in the interim 60s tops had risen from 41 cents to 69 cents and fallen back to 38 cents again. The costs of manufacturing have remained substantially unchanged between 1908, when 16 cents would buy 40s tops, and 1913 when they fetched 32 cents. Evidently high-priced goods and low-priced goods are not one and the same thing in all seasons.

Treating first of tops, and disregarding the fluctuations over periods, it is the fact that to comb 40s tops selling at 31 cents costs the same as to comb 46s worth 35 cents; and 50s, worth 46 cents, are combed at an additional expense of only 1/4 cent per pound. In this aspect therefore conversion costs do not advance in harmony with the value of the goods, but fall off very heavily. If the ground be shifted to finer tops costing 60 cents a pound the broad fact remains the same. The main increase in value is due not to the process, but to the rarity or desirability of the raw material.

Proceeding to worsted yarns, it is immediately found that the coarser wools cannot be spun to any great fineness and consequently the differences between the prices of any two counts of the same quality are unimportant. In all circumstances the main component is the value of the fiber. In the finest worsted yarns the top or the wool is still the dominant component, but between yarn of 64s quality spun to 2/24s, and the same spun to 2/60s, there is an appreciable difference of price. From a spinner's quotations it appears that the percentage of conversion cost in 2/24s must be about 15 per cent. and in 2/60s about 26 1/2 per cent. of the total price. Thus in this extreme instance the cost of conversion is materially greater in the higher priced product, but high and low are relative terms and it has to be reflected that 2/24s yarn of this quality is not used for manufacturing distinctively low-priced fabrics. In the specimen instance of a 54-cut Saxony woolen yarn the conversion cost is roughy 27 per cent. and in the case of a 24-cut cheviot woolen yarn is 17 1/2 per cent. Depending on the instances chosen, it is possible to give either a Yes or a No to the initial question in respect of yarn.

Cloths are high-priced or low-priced for various reasons and so much of the cost of manufacture arises in the weaving and finishing of them that the existing proportions

of cost are capable of being radically altered. Combing is in no case of much effect in submerging the cost of raw material and, in the case of wool of one quality, spinning only affects the equation within the narrow limits of the spinnable count. Yet the same wool and the same count of yarn and the same number of picks do eventually produce fabrics showing 25 or 30 per cent. difference in marketable value. The difference is not inevitable, but it occurs in England for example between sheer worsteds of 46s quality and milled and carefully finished worsted serges. Cost of conversion accounts for everything unless it be for use of a superior dyestuff and wherever there is a large outlay upon finishing there is no question of the tendency of costs to advance.

High-priced cloth is not precisely synonymous with fine cloth, but a cloth made of fine yarn has for its constituent parts material in which the conversion cost is high. As there are more ends in the warp there is more expense in warping and beaming and in the long run all weaving charges are regulated by the picks in the inch. In England weaving prices are directly based upon the picks and whether a piece of plain worsted costs $3.50 or $14 to wearer is a question of whether it has 50 picks or 200, like some of the high priced plains upon the market. The cost of mending varies with the complexity of the weave, the perfection of the yarn and the care and expense in weaving. Mending ought to cost little, but in practice it costs much and in bad cases as much as the weaving. Scouring, finishing and dyeing may cost net about $5 for 60 yards of 16-ounce cloth in an average case and more for indigo or alizarin. In general the higher the prices aimed at, the more must the expenses be. Those manufacturers who secure the best prices for fancy worsteds and tweeds spend certainly five per cent. of their turnover on designing and patterns. The selling expenses are heaviest on the highest-priced goods and on them also the credits are the longest.

To state a concrete case, the instance may be taken of manufacturers buying wool, tops or yarn of 64s quality in Yorkshire. They consume the yarn principally in counts between 2/28s and 2/48s and convert it into indigo serges weighing 18/19 oz. and selling at $1.38 to $1.50; or into 16 oz. fancies selling at $1.32 to $1.56. Ordinarily the higher the price sought and the smaller are the quantities ordered to one pattern and the higher the standard of perfection is pitched. The number of changes of warp and loom harness is increased and it is indisputable that in such a case, where the variable factors are eliminated, the highest prices accompany the highest conversion costs.

Where the variables are not eliminated, and where goods of a rudimentary character are compared with the most highly finished articles, differences will creep in, but on straight issues there is little room for doubt that the case is similar in most directions in England. It is difficult to call to mind any department of the trade in cloth in which a relatively little manufactured material, costing a high price raw, is sold again at a low charge for conversion. The tendencies of the times are all towards higher complexities in manufacture and these in one way and another all entail higher manufacturing costs sometimes balanced in part by higher costs of raw material. The case is so in Bradford, in Huddersfield, in Batley and in Scotland and the expense justifies itself in producing goods for which the customer is willing to pay better prices than formerly.

A MEETING OF PENNSYLVANIA UNDERWEAR MANUFACTURERS

The Pennsylvania branch of the National Association of Hosiery and Underwear Manufacturers held the semi-annual meeting at Hamburg, Pa., on July 12. The members were entertained at the bungalow of the Blue Mountain Fish and Game Association. After the dinner had been served the meeting was called to order by President Charles E. Leippe, and Edward Blood, Sr., was made chairman. An informal discussion of trade problems followed. These included the reduction of working time in Pennsylvania to 54 hours per week, the prices at which goods are being sold this

year, the regulation of credits, the purchase of yarn on a net weight basis, difficulties with special labels and packing, prepayment of freight, disposition of seconds, and estimating the cost of knit goods.

Following is a list of those present:

J. A. Adcock, J. C. Adcock & Bro., Pottsville; F. E. and J. R. Ammerman, Shamokin Underwear Mills, Shamokin; C. J. Baker, Parson & Baker, Phoenixville; Charles R. and S. D. Bausher, Gotham Underwear Mill, Hamburg; J. D. and Harry Berger, Berger Bros., Schuylkill Haven; Edward Blood, Sr., A. A. Blood, E. A. Blood, J. Blood & Bro., Philadelphia; W. R. Britton, Progressive Knitting Mills, Royersford; C. B. Carter, Philadelphia; D. D. Coldren, Schuylkill Haven; W. H. Diefenderfer, Auburn; A. L. Dunn, Hazel Knitting Mill Co., Hazelton; P. W. Fegley, Orwigsburg; A. J. Fink, Gotham Underwear Mill, Hamburg; Langhorne Fink, Hamburg Knitting Mills, Hamburg; C. W. Fisher, Textile Manufacturers' Journal, Philadelphia; A. S. Herbert and John Hornberger, A. S. Hornberger & Co., Mohnton; S. K. Hoffman, Hamburg Knitting Mills, Hamburg; M. C. Killian, A. S. Hornberger & Co., Mohnton; A. H. Kline, Standard Knitting Mill, Schuylkill Haven; Charles E. Lippe, Reading Hosiery Mills Reading, J. B. Lesher, Unrivaled Hosiery Mill, Williamstown; G. R. Mattis, Progressive Knitting Mills, Royersford; Walter T. Meck, Meck & Co., Schuylkill Haven; Arthur Miller, General Electric Co., Schenectady, N. Y.; R. P. Miller, Robert P. Miller & Co., Shoemakersville; I. R. Mosser, Wyomissing Hosiery Co., Mohnton; E. J. Moyer, Fehr Knitting Co., Reading; N. H. Moyer, N. H. Moyer & Son, Orwigsburg; Walter W. Moyer, Ephrata; J. C. Parsons, Parsons & Baker, Phoenixville; J. V. Poley, Royersford; T. M. Raubenhold, Hamburg Knitting Mills, Hamburg; H. A. Reber, Meck & Co., Schuylkill Haven; E. J. & R. E. Scheerer, W. F. Scheerer Sons Mfg. Co., Pottsville; C. F. and Dr. J. W. Schultz, Schultz Underwear Co., Reading; J. A. and E. S. Sharadin, Orwigsburg Knitting Mill, Orwigsburg; W. Smith, Gotham Underwear Mill, Hamburg; D. J. Stanton, Champion Knitting Mill, Schuylkill Haven; J. J. Taylor, Swissonia Knitting Mills, Allentown; T. J. Whittaker, Hazel Knitting Mill Co., Hazelton; G. A. Zook, Gotham Underwear Mill, Hamburg.

The shipments of raw silk from Milan to the United States fell from $17,180,416 in 1909 to $10,948,745 in 1910, while the exports of manufactures of pure silk dropped from $187,126 to $45,270.

The United States has the second largest number of cotton spindles in the world, exceeding those of Germany, France and Russia combined, and being exceeded only by those in the United Kingdom.

HOW THE UNDERWOOD BILL LOOKS TO THE AUSTRALIANS

From Dalgety's Review

The pending new era in connection with the wool industry in the United States opens up vast possibilities of increased trade with Australia, and the question naturally arises as to the best means of bringing before the American woolmen the merits and varying characteristics of our staple product. The business man upon opening up relations with a new customer or who desires to materially extend his operations with an old one, will at once take steps to supply a full range of samples, so that the customer may carefully select those best suited to his requirements.

Advertising Australian Wool. In like manner the Australian woolgrower might well consider the advisability of arranging for a comprehensive display of the various types of wool marketed here to be sent to the United States and brought prominently under the notice of the American wool men. While our wools are already well and favorably known in America, a little advertising at this juncture cannot but be fraught with the best results; and the reception recently given in Yorkshire to the wool trophy originally arranged for the Roubaix exhibition may be taken as an index of how welcome such a display would be. The Yorkshire trade is in a far better position to know the range of wools produced here than are our prospective American customers, yet they found the exhibit most interesting, and it was closely examined at each center where an exhibition was arranged. To prepare a comprehensive display for America would take time, and in the meantime it might be found advisable to arrange for the Roubaix trophy to be sent across the Atlantic. It is thoroughly representative of the various types of wool produced in this State, and it could be used as an effective advertisement as soon as the new tariff is in force. If accompanied by a representative from the High Commissioner's office, it could be taken to New York, Boston, and other centers, and brought prominently under the notice of the trade; and no doubt there are

many wool men connected with the American industry to which it would be in the nature of a revelation.

An Australian Wool Exhibit. One advantage of such an effective exhibit would probably be that it would tend to induce Americans to deal more in a direct way with the Australian selling centers, because they would recognize that a wider selection would necessarily be found at the seat of production. While to some extent it may not appear a vital matter whether the Americans fill their order in England or in Australia, there can be no doubt that the more American competition that can be attracted to the primary markets during the main selling season the better are results likely to be to the generality of growers who now support the local markets. The great feature, however, would be the fact that the wider range of types and the better facilities for securing special lines would naturally appeal to such keen business people as the Americans, who are hardly likely to be content to take what is left of our wools after Germany, France and Yorkshire have enjoyed a first selection.

It is a great pity that some means are not adopted each season to secure representative fleeces from every important sheep district, which could be used for purposes of record in noting the development of the wool and the effect of the varying seasons on its growth and would then form the nucleus of a collection from which an effective display could be quickly arranged whenever such an opportunity arose as is presented by the revision of the tariff in America. This is an age of advertisement, and the idea that our wools are too well known to need any advertisement is a conservative one, which must be discarded. New avenues are opening up, and even in the old ones the greatest interest attaches in noting how the character of our wool is being maintained in the face of the inroads of closer settlement and the changing seasons.

A FLOCK OF AUSTRALIAN MERINOS AT BUNGAREE.

THE JAPANESE MARKET FOR WOOL

The tariff revision in America suddenly opens the door much wider for our wools, but there is also a gradual opening of new doors in the East, and here, quite as much as in America, the wisdom of representative displays of our wool, collected and arranged with full descriptive details, will readily be recognized. Some years ago a display of type samples was arranged for exhibition, and they were subsequently distributed among the existing mills. It would probably be a good idea to bring these displays up to date, and to arrange with our commercial agent in the East for the effective distribution of samples and full particulars

of the varying types of wool obtainable in Australia. The Japanese industry has made very distinct progress of late years, and what has already happened in Japan is about to take place in China. Already several mills have been established, and the manufacturing trade is emerging from the experimental stage and now is surely an opportune time to assist the movement and educate the Chinese manufacturers as to the merits of our wool. No better method could be found of doing this than in placing in such centers as the Commercial Agent in the East would suggest representative displays of every type of our wools.

The arrangement of a central display in Sydney from which all these exhibits could be drawn should not be a difficult matter with such an institution as the Technical College sheep and wool classes already in existence. Not only would the task of arranging the fleeces into effective displays be readily undertaken by the Department, but it would provide the classes with a far more educative selection of wool than it can possibly hope to secure now, and the task of arrangement would add to the educational value of the institution. The chief instructor at the classes, Mr. Hawkesworth, is a gentleman who has had experience in arranging displays, and could be relied upon to undertake such a task with enthusiasm.

A REVOLUTION AND NOT A REVISION

Returning to the proposal to effectively advertise our wools in America we have to consider the aspect of the case suggested by the fact that the present tariff proposals are more in the nature of a revolution than a revision, and there are solid grounds for hoping that the new tariff will prove so acceptable to the American people that its permanency as regards wool will be assured. We are face to face with the fact that America cannot possibly fill her own requirements, as even with the aid of an almost prohibitive tariff her flocks have not only shown no expansion, but have seriously declined. The number of sheep in the United States was recently estimated by the National Association of Wool Manufacturers as 38,481,000 head, which is only about equal to the total in 1896, when there was free wool. The wool clip last year was 262,543,000 lbs., or only about half the quantity of wool used in American mills, the balance having been imported. As compared with four years ago, the falling off in the clip was 68,000,000 lbs. The average imports of wool into New York, Boston and Philadelphia during the past few years have been between 250 and 260 million lbs. The relative importance of various wool-using countries was shown by the following summary of wool used for manufacturing purposes in 1910:

United Kingdom	lbs.	492,000,000
United States		480,000,000
France		457,000,000
Germany		380,000,000
Austria Hungary		132,000,000
Italy		57,000,000
Total	lbs.	1,998,000,000

The above should convince everyone how necessary it is to do everything possible to push our wools into prominence in America.

The following shows at a glance the fluctuation in production in the United States since 1840:

1840	lbs.	35,802,114
1850		52,516,959
1860		60,264,913
1870		162,000,000
1880		232,500,000
1890		276,000,000
1900		288,636,621
1905		299,309,853
1910		336,896,903
1912		262,543,000

PROBABLE EFFECTS OF FREE WOOL

The value of the proposed free wool tariff to the Australian wool industry is by no means restricted to the probable increase in our direct exports of raw wool to the United States. That there will be an appreciable increase in such exports cannot be disputed for a moment, but the big trade likely to arise with Bradford, both in regard to tops and manufactures, will have a further influence on the demand for wool, and the two factors together must have a natural tendency to stiffen wool values everywhere. The demand for wool is so keen under existing circumstances and the world's supplies so inadequate to requirements that

this fresh and important factor would appear to assure the permanency of high values for wool. The shrinkage in U. S. A. flocks, now pronounced, must inevitably be accentuated and the production of wool effected to even a greater extent than the decline in the sheep totals would reveal, as, with population increasing, and slaughterings for mutton rapidly extending, the farmer will pay more attention to the fat stock than the wool market.

EFFECT OF FREE WOOL

It is rather surprising to find the theory put forward in a contemporary that the probable effect of "free wool" in U. S. A. will be an expansion in their wool-growing industry, yet this statement has been made apparently in all seriousness. The theory is based on two assumptions equally incorrect. The first is that America only wants superfine wools, and the second that the cost is in favor of U. S. A. growers. Taking past history as a guide and with also a knowledge of the present feeling in the wool trade, it is beyond dispute that the new tariff will lead to a broadening of the American demand. The superfine light free wools were necessary when a duty of 5 1/2d per lb. had to be faced, but the expected demand is for good average wools, which include the bulk of our production. As to the cost being in favor of U. S. A. growers, the Tariff Commission reported that it cost more to grow wool in U. S. A. than in any other country, and that the lowest average cost was in Australia. If wool-growing cannot progress with the aid of a 5 1/2d per lb. preference over "foreign" wools, it is hard to see how the industry is helped to expand by taking away the protection. The contention put forward is so palpably against reason, logic and history, as to call for no further repudiation. Australian woolgrowers must not expect that "free wool" in U. S. A. means the arrival of the millenium, but they can rest assured that it is the best possible development in strengthening the wool outlook and guaranteeing the permanency of highly remunerative values for our staple product.

PREVIOUS DISAPPOINTMENT

Great disappointment was felt in 1911 when the effort to moderate the tariff failed, but if the present proposals are carried the previous failure will be reckoned a blessing in disguise. The Underwood-La Follette Compromise Bill provided for a duty of 29 per cent. and was carried in the House of Representatives by 206 votes to 90, and in the Senate by 38 votes to 28. President Taft vetoed the bill, and the attempt to pass the bill over the veto, which required a two-thirds majority, failed, the voting being 227 to 129.

President Taft declared for the principle of protection, the rates of duty to be measured by the difference in cost of production at home and abroad, and appointed a Tariff Commission to make careful and thorough investigation in various countries. This commission reported that it cost more to grow wool in the United States than in any other country; that the merino wools required in such volume by the U. S. A. mills were the most expensive of all wools produced; that the highest cost of production of such wool in the world was in the State of Ohio and contiguous territory, and that the lowest average cost in similar wool was in Australia.

The report went on to state that after crediting the flock with receipts from all sources other than wool, the latter product, in the case of the finer wools of the United States, was going to market with an average charge against it of not less than 12 cents per lb., not including interest on investment; that the fine wools of the Ohio region were sold bearing an average charge for production of 19 cents per lb.; that if account be taken of the entire wool production of the United States, including both fine and coarse wools, the average charge against the clip was about 9 1/2 cents per lb.

PROBABLE DECREASE IN AMERICAN PRODUCTION

The above, if only approximately correct, is a clear indication that without the aid of a duty wool production must fall off seriously in the United States, and that a corre-

spondingly large increase will arise in the demand for wool from countries where it is profitably grown without spoon-feeding of any description. The falling off in the United States clip during recent years has been attributed to two facts: first, that wool production has not been a very profitable industry despite the heavy duties, and secondly (and perhaps principally) to the increase in the consumption of mutton. The slaughterings in the States are estimated as between 14 and 15 millions annually, which, being equal to the lamb crop, automatically checks the increase of flocks. The slaughterings at the principal centers, which does not take into consideration the killings for local consumption in the smaller towns or on the farms, reached a total of over ten million sheep in 1910, as compared with only 4 1/2 millions in 1888, so that in a little over two decades the slaughterings have doubled. In the previous free wool period the flocks decreased by 10,000,000 and the production of U. S. A. wool by 88,000,000 lbs. With the duties removed it is only natural to expect that large numbers of wool-growers will turn to more profitable avenues of production and that there will be a heavy decline in sheep numbers and wool production. The new tariff will not only help our wool industry, but will open up an important market for our meat.

PREVIOUS DUTIES A MISTAKE

The Tariff Commission in U. S. A. made clear to the public that the 16 1/2d duty on scoured wool was not only prohibitive, but that it was hampering manufacture. The duty, they pointed out, effectively prevented the importation of clean low-priced foreign wools of the lower grades that would be exceedingly useful in the manufacture of woolens in U. S. A., and if so used might displace in a large measure the cheap substitutes now so frequently employed in that industry. There was a very appreciable increase in scoured imports during the last free wool era, since which, however, the duty has been effective in strangling the trade. The position of local scoureds will be considerably strengthened by the opening up of the American market to them, and the value of this new factor to the trade is not to be reckoned by the actual volume bought so much as the increased competition, which has its influence on the whole of the offerings.

WOOL TOPS

Under the present proposals the duty on wool tops is put down at 15 per cent. This is an even more favorable position than in the previous free wool era when tops paid a duty of 20 per cent., and yet a very satisfactory trade was found possible under that duty. The first year the shipments of tops from Bradford were valued at £48,000, and during the last year the imports were valued at over a quarter of a million. Whether Australia shares in the demand for tops or not it benefits by the opening of a wider field to our customers in Bradford.

The following tabulated statement gives the value of exports of stuffs, worsted coatings, and wool from Bradford to America during the past two decades, and shows how the trade expanded during the previous "free wool" era, an expansion which we may reasonably hope to see repeated in an accentuated form during the next few years. In passing it may be mentioned that the period of office of the present administration will expire in March, 1917, by which time the effect of the new scheme should be evident and will probably lead to a further extension. The Democrats have been out of power at Washington since 1897, and if they are to have as long a lease of office as the Republicans have enjoyed their stay in office should extend to somewhere about 1829. Following are the details of Bradford trade with America:

Year	Stuff £	Coatings £	Wool £
1893	706,086	727,180	122,954
1894	595,904	443,363	221,933
1895	2,001,748	1,757,950	610,994
1896	998,634	630,580	303,537
1897	1,215,169	693,793	1,783,255
1898	520,146	83,052	114,125
1899	532,516	73,550	189,233
1900	468,896	63,847	279,596
1901	449,765	57,279	186,760
1902	674,159	67,057	361,026
1903	648,114	70,982	828,794
1904	817,505	60,172	822,895
1905	176,544	49,813	1,101,941
1906	798,679	61,948	900,911
1907	791,094	79,693	908,230
1908	524,200	67,500	850,000
1909	754,402	152,901	1,959,457
1910	969,823	149,616	849,654
1911	269,521	191,899	502,005
1912	322,564	58,556	1,412,345

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

THE PROCESS OF MOIRE FINISHING

BY ROBERT DANTZER

Translated from the French by the Editor of the Textile World Record.

This finish is produced by a mechanical process which transforms the appearance of the fabric. The fabrics best suited to receive the moire finish are those in which the weave is most distinct. The process is chiefly used for finishing silk fabrics such as poult de soie, gros de Tours and fabrics made with silk warp and cotton or wool filling, that is, with a fine, closely set warp and a fairly coarse filling. This finish gives to the cloth a marble-like effect which varies in form and aspect according to the direction from which it is examined. The operation flattens the threads and as a result of the crushing of the filling at certain points variable lines and shades are produced arising from the combination of surfaces reflecting light at different angles.

The discovery of this finish was made by the Chinese who enjoyed a monopoly of it for a long time. The English were the only ones to employ it in Europe previous to 1754, in which year the French government established John Badger in the business at Lyons. By carrying to Lyons this secret which had enriched England, Badger rendered a great service to the French industry. In 1860 the Chamber of Commerce at Lyons granted a life pension to Badger's granddaughter.

There are two processes of moire finish: 1, moire antique, and 2, moire ronde. Badger introduced into France the moire antique finish which is still called English, while the other finish is called French.

MOIRE ANTIQUE

The cloth is first folded so as to join the selvages, which are then fastened by sewing at intervals of 10 to 15 inches, the face of the cloth being inside. If one of the selvages is longer than the other it is slackened before sewing the two together in order that the filling may be held in its normal position. The edge of the fabric is then cut obliquely with scissors. The finish will be imperfect if the selvages stretch more than the body of the cloth. After doubling, the piece is folded in 2-foot lengths, one fold on top of the other. The piece is now placed on a strong linen fabric in such a way that the folds form an angle of 45°, as shown at Fig. 1. In other words the folds instead of being superimposed vertically are

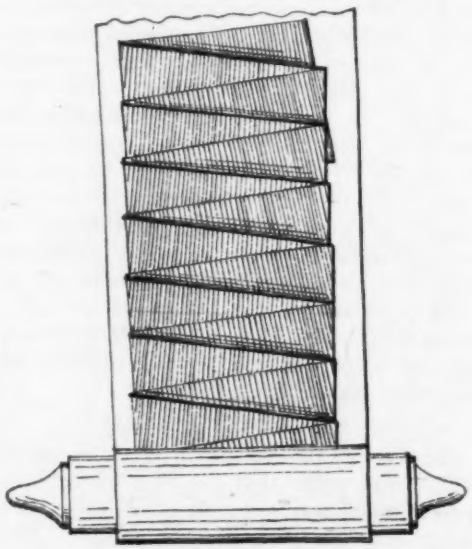


FIG. 1

arranged so that the ends are drawn in on one side and project on the other. In this way the two sides of the folds form a gradual slant terminating in a single fold. This special method of folding is called "dossage oblique". The fabric thus arranged is wound on a roller from 6 to 9 iches in diameter and is then covered with several thicknesses of strong cloth, which is tied with cords at the ends. The roll is then carried to the mangle, Fig. 2, which consists of a strong box, 1, about 10 feet long, 5 feet

wide and 4 feet high. A heavy plank, 2, forms the bottom. There is a plate, 3, on which the machine operates. The rolls, 4 and 5, on which the cloth has been wound, are placed crossways of the box, which is loaded with heavy weights. The box is moved by aid of the ropes, 6 and 7, which run over pulleys to an upright windlass. As

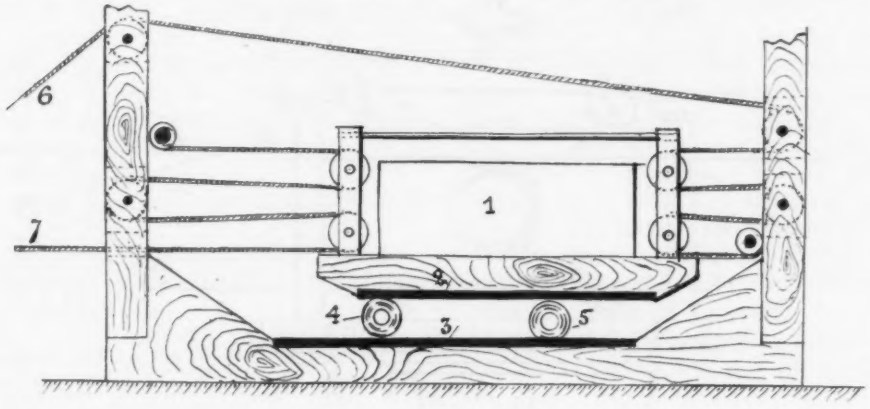


FIG. 2

a result of this movement the loaded box rolls back and forth on the cloth rollers, 4 and 5, and produces the moire effect as a result of the pressure. The weight in the box, 1, varies from 80 to 110,000 pounds according to the finish desired.

The first operation lasts for about 15 minutes when the rolls are removed in order to examine the finish. If the undulations are not sufficiently distinct the goods are subjected to another passage in the mangle. When the desired effect is obtained the cloth is unrolled, as shown at Fig. 3, and folded again in such a way as to change the position of the folds. It is then wound on the rollers and subjected to another passage through the mangle. This changing of the folds makes the finish more uniform.

The most popular moire finish is that which shows large waves terminating in two narrow stripes and showing no bars. The waves appear in an oblique line. The cloth is subjected to five or six passages through the mangle. There are a great variety of effects produced in moire antique and it is difficult to find two pieces that have the same appearance. There is no regularity in the patterns obtained. Here are the groups forming the shades, there the weaves, farther on, broken lines, all the result of chance.

The old style mangle was inconvenient and open to many objections. It involved a loss of much time not only in getting it into operation, but in subjecting the cloth to the work required for the desired finish. If the rollers became displaced the box would run diagonally, causing wrinkles or even cuts in the cloth.

Fig. 4 shows an improved mangle used for

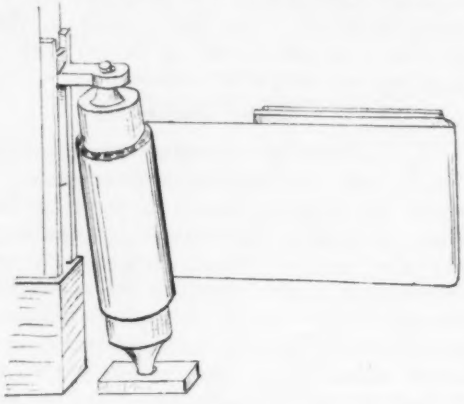


FIG 3

moire antique and built by Vignet and Barbier, French patent, December 10, 1854. The cloth is rolled, as already described, and placed between the plates, 2 and 3. The lower plate, 3, rests on the rollers, 8 and 9;

the plate, 2, resting against the roller, 6 and 7. The necessary pressure is obtained by means of a hydraulic press, 10. The plates, 2 and 3, are connected by the rods, 4 and 5, to the crank head carrying the gears, 11. The operation of this machine is very simple and the results are equal to those obtained from the old mangle and without the objections to the old machine.

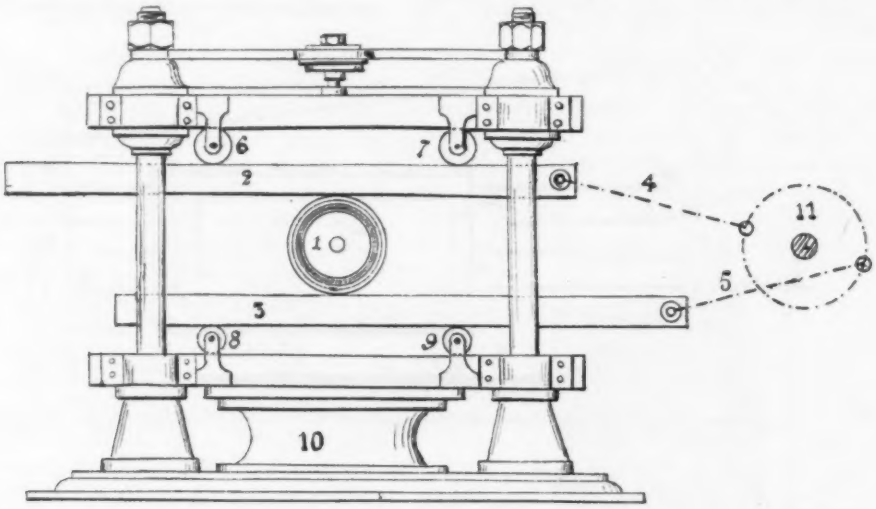


FIG. 4

Light weight silks are prepared for the moire finish by sizing lightly with a white gelatine solution consisting of 170 parts of gelatine to 1,000 parts of water.

MOIRE RONDE

The French government commissioned Vaucanson, the engineer, to construct a moire finishing machine of moderate dimensions and more convenient in operation than the one invented by Badger. The result was the construction of the cylindrical calender. This machine is built on the principle of the rolling mill and has two hollow metal cylinders. A bar of iron heated to redness is placed inside the cylinder, and exchanged for another as it loses its heat. By a system of levers a pressure as high as 130,000 pounds is obtained between the cylinder. The moire finish thus obtained is the same as that produced by the Badger machine. It produces the same round forms which imitate fairly well the markings of a cross section of a tree trunk.

The piece is first folded and the selvages sewed as for the moire antique. When two filling threads come directly over each other and pass through the calender, the increased thickness thus obtained causes a crushing of the filling threads. On the other hand,

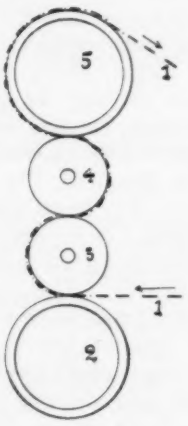


FIG. 5

the threads retain their round form when the filling thread rests in the depressions

between two filling threads of the opposite fold.

Fig. 5 shows a cross section of the calender rolls which are now generally used for the production of this glossy finish. The cloth, 1, passes over the heated cylinder, 2, pressure being obtained by the paper roll, 3. The cast iron roll, 4, carries the fabric to the heated cylinder, 5. This double pressure is open to the objections that it disarranges the effect of the moire finish. In most cases the cloth is subjected to only one passage between the rollers, 2 and 3.

Three kinds of moire finish can be obtained on the calender rolls shown at Fig. 5:

(a) With one fabric.

(b) With two thicknesses of the same fabric.

(c) With two different fabrics.

Each of these three finishes give characteristic effects.

MOIRE FINISH ON A SINGLE FABRIC

This finish can be obtained with three different methods of folding:

1. The first method is to calender the cloth after it has been folded and fastened at the selvages. The piece is folded with the face inside. The effect produced is very similar to that of the moire antique, showing the same beautiful columns lengthways of the piece, the marking being very distinct.

2. The piece is folded lengthways with the face inside and the ends then folded and fastened by sewing. In this way an imitation of the moire ronde is obtained.

3. The piece is folded as explained for the moire antique and passed over the heated cylinder. The effects are beautiful, but the diagonal fold is very difficult to handle.

MOIRE FINISH ON TWO PIECES OF THE SAME CLOTH

The pieces are placed face to face and the ends and selvages sewed together. The same effect is produced as when folding the ends of a single piece, already explained. Sometimes the pieces are drawn under a high tension over the regular corrugations in a wood plank. This modifies the moire effect.

MOIRE FINISH WITH TWO DIFFERENT FABRICS

The two pieces, face to face, are sewed and subjected to the process already explained. Usually the effects produced are not as attractive as with the other method. One defect in the moire finish produced by calender rolls is its slight resistance to humidity.

THE USE OF ENGRAVED ROLLS

A design is produced on the cloth by means of engraved rolls. The machine consists of a two-roll calender, the upper roll being steel and the lower roll, which is hollow, is heated with gas or steam. The piece passes in the open width between two rolls and the moire finish is produced on the face. The cloth should be sized before being run through the calender. Silk goods are sized with solutions of lac, copal, dammar or rosin in benzine, turpentine or naptha. These solutions glaze the cloth and enables the moire finish to resist the effects of moisture.

The method of engraving the cylinders has been the subject of several patents, particularly one by Voland & Co., French patent No. 218,575, January 12, 1892. Attempts have been made to produce the moire effect in weaving on the loom and a patent for this purpose has been granted on January 5, 1894, to the Societe Bonnet Ramel Savigny, Girard & Marnas, No. 235,596.

WRAPPING COTTON BALES

Renner, Tex., July 18, 1913.

Editor Textile World Record:

While reading the Textile World Record, the idea occurred to me that, as the price of jute has gone almost to a prohibitory point, a substitute must be found for wrapping cotton bales.

At a ginners' meeting at Dallas a plan was put forward to manufacture waste jute and low grade cotton into bagging. A company was formed in Dallas, independent of the ginners, for the same purpose. The objection to the use of cotton was the lightness and susceptibility to fire. The gross tare of all 500-pound bales is 6 per cent. or 30

pounds per bale. The wrappings must weigh 2 to 2 1/4 pounds to the yard, as six are used to the bale. Adding a solution, which would not only give it weight, but make it resist the action of fire, might prove an effective remedy. The one who will solve this problem will not only confer a great benefit to the cotton trade, but will reap a handsome reward for his trouble. If this appeals to you hand it to some one to be worked out.

Respectfully yours,

F. W. Jackson,

President of the Ginners' Association.

FUR EFFECTS ON PILE FABRICS

BY JAMES STRAND

Crimping and Embossing. The present fashion for fur effects has aroused inquiry as to the means taken to finish plush and raised-pile goods to obtain imitation-skin patterns and other fancy designs. This department is a specialty in the hands of comparatively few people and of late years it has undergone improvements. To begin with a simple case, the production of crimp or caracol effects may first be considered. In the May issue of this magazine, p. 273, Robert Dantzer has outlined an old-fashioned method of producing crimps by crumpling the fabric in a sack and boiling it. That method has long been superseded in England by the use of a crimping machine which in turn has been made obsolescent by further improvements. In entering the machine the cloth is rather irregularly pleated in width and then rumpled or pleated in length and in this state is wound between canvas aroud a perforated roller and then the crimps are set by the action of steam.

Large quantities of cheap plushes, often sold under the name of "dogskins" have been treated in this manner, but the effect obtained is mechanical and of course the back of the fabric is crimped as well as the face. A greatly superior effect is obtained by the use of the new method. Two wrappers are used upon the new machine, one of them plain to protect the back of the fabric, the other a stout cotton fabric on which twine has been stitched in irregular curves,

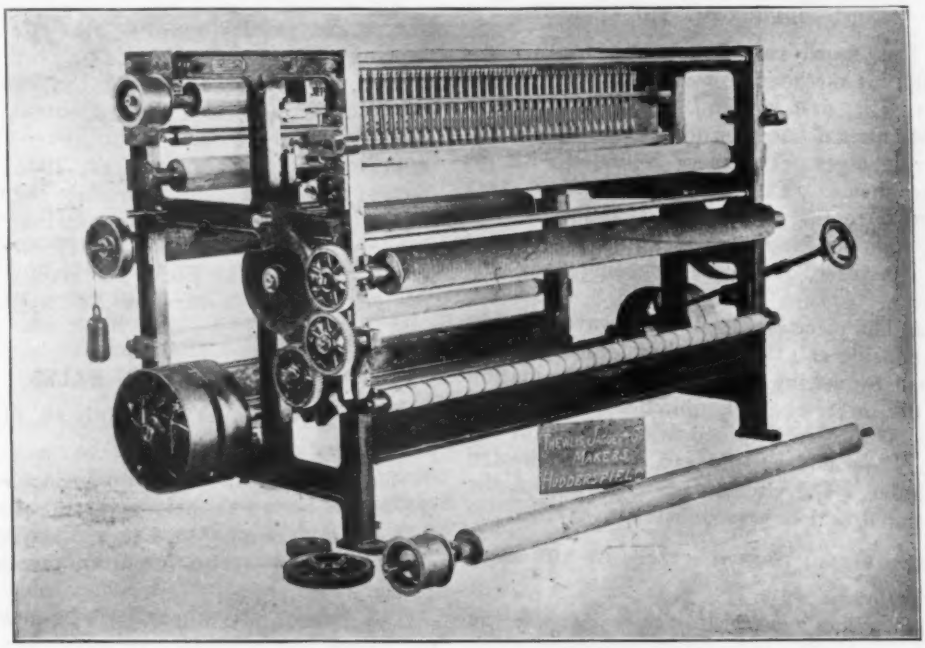


FIG. 1

forming in high relief the caracol pattern which will be embossed in low relief upon the face of the fabric. This twine is laid and stitched down with sewing thread by hand and the freehand irregularities prevent monotony in the finished appearance. Wrapped between these two cloths the fabric is wound upon what is substantially a steam-blowing and cooling or decatizing machine. The pile is firmly embossed with the design and the back is plain.

There is another style of embossing, not

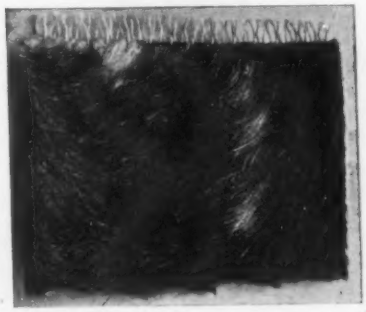


FIG. 2. CIVET CAT FUR.

to be recommended for heavy fabrics, in which the cloth is passed through brass or iron rollers which serve as die and counter-die and impress the engraved pattern both on the front and back of the cloth. Separate rollers have to be obtained for each design and the pressure and the cutting action of the rollers are bad for the fabric.

BRUSHED EFFECTS

Some of the most interesting effects are obtained by brushing a pile that has already been raised or cut. The simplest effect is that of plain striping, obtained by brushing the wet pile as the fabric passes under tension over a steam chest. A cylindrical brush is used and a stencil knife controls the width and position of the stripes. These plain stripes may be diversified by an attachment to the brushing machine. A shaft is provided, carrying slidable circular brushes of stiff bristle set with the points converging. These brushes are moved to the positions required, and accordingly as they are driven faster or slower than the fabric, they kick-up or lay the pile at the point of contact, which may be either a constant or an intermittent point.

Such is the arrangement for making brushed stripes warpways. In some cases brushed effects are wanted fillingways, and then stencil plates and cross brushes are used. These are not the most admirable effects produced by brushing.

WHIRLPOOL PATTERNS

Very complex patterns are produced by the use of the whirlpool brushing machine, made by Thewlis & Co., Huddersfield. Fig. 1 shows one type of this machine and not the most elaborate one. It will be seen that the brushes are small independent, rotating in a horizontal plane. Acting upon a fabric which is momentarily stationary they brush the nap or pile into circular whirls and produce a series of these adjoining each other. In an improved machine each of these brushes has a smaller satellite brush revolving around the same axis, but laying the pile in the contrary direction. Thus a series of larger circles is formed with the nap around the circumference laid to the left and with the central pile laid to the right.

Such is the result when the spindles are driven all in one direction upon stationary cloth. There is, however, no necessity for driving the brushes all in one direction and on driving alternate single brushes in opposite directions and allowing them to bear upon moving cloth, the pile is parted or "pony-backed" and is laid left by one brush and right by another. It follows that whenever the action ends a complete whirl or circle terminates the pattern, but this can be avoided by providing that the cloth shall be lowered away from the brushes.

So much having been explained, it is readily seen how the pattern called "civet cat," Fig. 2, in the United States, a pattern which imitates stitched natural skins, comes to be fashioned. Using the "straight draw-through" motion, lowering the cloth at the appointed time and sidestepping the brushes so that the laid pile follows the pony-back parting of the section immediately ahead of it, a very realistic imitation is obtained of

sewn natural skins. The number of change motions upon the machine make possible the execution of an endless number of fancy effects in pile-laying.

TIPPING, DISCHARGING AND CUTTING

The realism of imitation skin effects is greatly increased by using machines to tip the ends of the white or light colored pile with color. This is done by passing the fabric over a grip supporting roller in face of which are set two flannel-covered rollers, the lower of which takes up dye from a trough. The color rollers work tightly against each other so that the distribution of dye is perfectly even. A similar machine performs the converse of this operation in precisely the same manner. The discharging machine applies, not color, but a stripping agent to the tips of the pile and decolorizes the ends of the dyed fibers.

Effects got by cutting velvet pile are on rather a different plane from the foregoing and the shearing machine is a fairly familiar object of the mill. The blade is of course a spiral with a scissor-edge working against a delicately adjusted plate knife. A serrated knife is used for cutting stripes and separate ones must be kept for each pattern. For cutting diagonals the cloth is fed diagonally to the cutter and the blades are lifted by tappets at the end of the traverse. Cutting, brushing, tipping and discharging have at all events one thing in common, for the machines all call for delicate and accurate adjustment.

THE MANUFACTURE OF ELASTIC FABRICS

BY SAMUEL BROWN

The simplest form of elastic web woven is the fabric such as is used for the making of garters and bands. This is ordinarily a single cloth, having what is known as a wire edge, and in which the appearance of the web is mainly derived from the filling or weft. A rib effect is produced by the rubber thread, which lies under the filling; each rubber thread being separated by a variable number of cotton warp threads, which bind the whole together by the weave used. This weave is generally two up and two down, while the rubber weave is one up and one down. The warp which is used to divide the individual strands of rubber is known as the binder warp, and binds the whole fabric together. There is often used also an additional warp known as the gut, shown at Fig. 19, which weaves with the

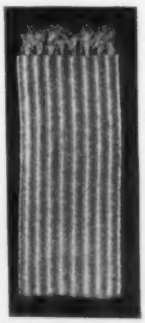


FIG. 19

FIG. 21

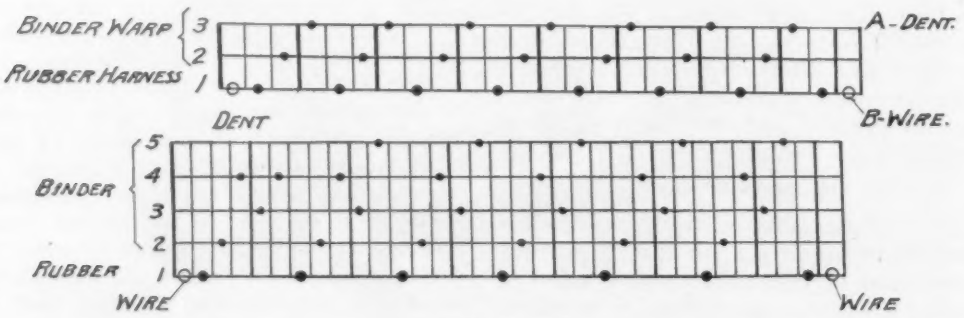


FIG. 23

rubber thread. This warp is used for the two-fold purpose of giving additional body to the fabric, and of regulating in a measure the length of stretch in the goods. The more gut there is used, the less becomes the power of contraction by the rubber warp,

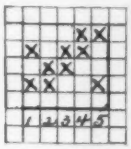


FIG. 20

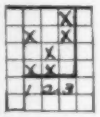


FIG 22

and therefore the shorter the stretch which is produced. Aside from the fineness and body of the goods, this element of stretch largely governs the market value of the fabric, so that great judgment and care must be exercised in the assembling of the different sizes of yarns. Weft, binder and gut, each play a part in governing the stretch, as does the number of picks per inch. Any excess of weight in the binder warp will materially reduce the stretch. In fact any one of these features, wrongly adjusted, may result in the difference between profit and loss.

In making the selvage of these goods, a hard steel wire is used, round which the filling passes at each pick. This wire is highly tempered piano wire and must be of the very best quality, imported wire being generally used. The wire works on the rubber harness (one up and one down) and is placed in a dent of the front reed, the next outside the edge or selvage rubber thread. This dent in the reed must also be of hardened steel, in order to withstand the constant friction with the wire, which is crowded against it by the nipping action of the filling and the repeated beat at the same place in the dent at the weaving line. The size of the wire used must be adjusted to meet the variable conditions of contraction at the center or body of the fabric, in order to keep the goods flat and level. The wire is fastened at the back of the loom, by a slip knot adjustable cord; so that the length of the end of the wire woven into the goods at the breastpiece can be easily and quickly regulated. The wire is usually allowed to lie in the goods for about three inches while being woven, and draws out automatically pick by pick as the fabric passes away from the front reed to the press rolls. The edge rubber thread lies in the same cavity in the goods as the wire does while it is being woven. As the wire is drawn away, this edge rubber has more or less freedom according to the size of the wire which has been used, and the tension upon the weft thread. Should the wire be too fine, the edge rubber will be bound tight by the filling, and the goods may not contract enough at the selvage, causing them to "frill." Should the wire be too coarse, when it is drawn out of the goods it will leave a large cavity, giving the edge rubber too much freedom, and as a result the selvage will contract too much, and the goods will "belly," that is, be shorter at the edges than in the center.

FIG. 25

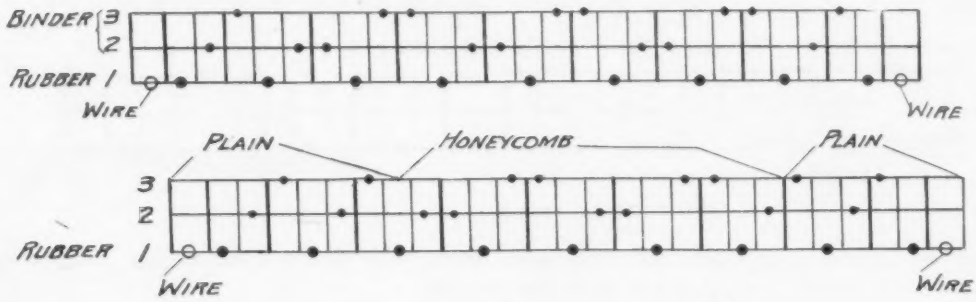


FIG. 26

Fig. 20 is the weave of the rubber warp, together with 2 harness of cotton binder

warps. Fig. 21 shows the draft of the weave for 8 strands of rubber. The plan generally used for dividing the threads in the front reed is also shown. The dents in the reed are indicated by A and the edge wire by B. Fig. 22 is the weave of the rubber together with 4 harness cotton binder warps. Fig. 24 is the draft of the weave.

Goods such as have been described, made with a plain carded cotton yarn for the filling or weft, are called loom webs. If the goods are made with a combed and gassed yarn for the filling or weft, they are known to the trade as lisle webs. In weaving lisle webs, the high tension at which it is necessary to work the rubber warps, together with the small weight required on the cotton binder warps, produces a tendency for such goods to bound at the front reed, and to slide up and down when passing over the rod at the breast beam. This motion is liable to polish the goods. This objectionable feature is counteracted by allowing each strip of web to pass over a small felt covered wood tube, which revolves on the breast beam rod, responding to the movement of the bounding web. In this way there is no friction to interfere with the bloom on the yarn. This liability to polish also arises when the goods pass through the press rolls before contraction takes place, and this is prevented by covering all the rollers with felt.

Inasmuch as the appearance of this type of web is dependent almost wholly on the filling or weft, the necessity arises for great regularity in the dyeing of such yarn, otherwise bars of shaded effect are liable to creep in. This is often the result of poor packing in the boiling kiers, or unsatisfactory boiling of the yarn, either of which will prohibit the uniform distribution of the dye color. It may also arise from the irregular handling of the yarn in the dye boxes, from the flowing of a color in the extracter, or from the failure to rotate the sticks on which the yarn is hung in the drying machine. Any and all of these causes must be prevented in preparing dyed yarns for goods of this character, in order to avoid irregularity of shade. The use of yarn dyed in the warp, instead of in the skein to be used for filling purposes, reduces the risk of barred goods to a maximum; and this method is fast coming in favor.

FIG. 24

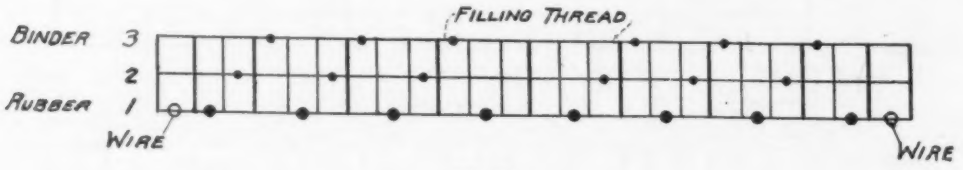


FIG. 27

In goods of this type, the scope for variety of effect is very limited, and confined to a few simple drafts in weaving, and fancy effects in yarns. The most popular of these weaves apart from the plain effects shown at Fig. 20 to Fig. 23, is the honeycomb, which is often used as shown at Fig. 25, and sometimes in combination with the plain weave, as shown in Fig. 26, in which there are 2 cords plain outside and 4 cords of honeycomb in the center. Another effect in such goods which is often used to relieve the flatness of the perfectly plain web, is produced by leaving out the binder between two rubber threads, 4 and 5, Fig. 27. This

omission produces a broad heavy rib, and shows up to good advantage at this particular point. The luster of the filling yarn contrasts with the other parts of the fabric, where the filling is bound down between each cord. Additional gut warp threads must be put in at rubber threads 4 and 5, as the taking away of the binder threads gives the rubber more freedom to contract, and as a result the web is drawn up at this point in a very unsatisfactory manner.

uniform appearance of the goods. The aim in this weave is to produce the wide rib as flat and lustrous as possible, and avoid all tendency for these pairs of rubber threads to round up the rib by getting together. This is accomplished by the use of a fine front reed, which allows for an extra dent between each pair of rubbers, in which dent the gut threads are placed. Fig. 28 shows a web with 18 rubber threads, in which there are 8 wide ribs. In this web there are 28

FIG. 28

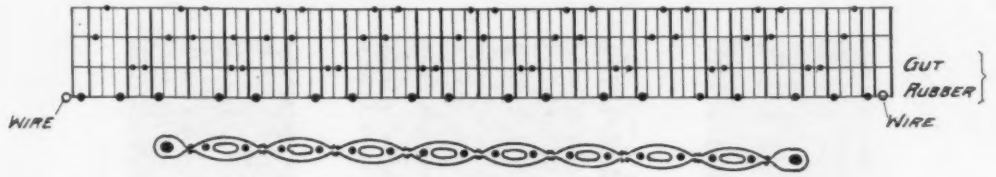
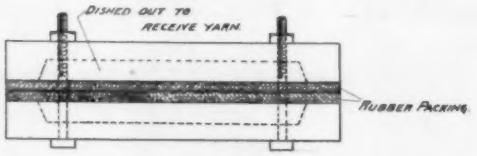


FIG. 29

Another weave which has come into favor is known as the cable web. The binder threads are used only between alternating rubbers, and the filling is thus floated over the space occupied by two rubbers instead

FIG. 30



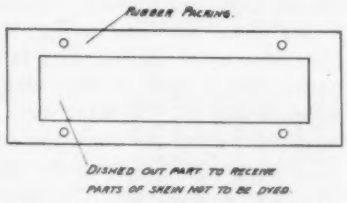


FIG 31

of one, as in plain weaves. This float gives to the fabric a very smooth handling and lustrous appearance. Up to within a very brief period, webs of this character were made by the use of a flat rubber, except in the edge. This necessitated a special warp for the edge rubbers, and great care also had to be used to keep the flat threads from twisting and rolling and thus spoiling the

spaces used in the front reed, including those for the wires, whereas in the regular plain web only 20 spaces would be needed. The first and second harness work together one up and one down, but the gut is placed on a separate harness to avoid crowding the heddles on the harness bars. The third and fourth harness are for the binder warp and work 2 up and 2 down. Fig. 29 is a cross section of this cable web, and shows the way the rubber should lie in a properly formed cable when thus divided by the gut.

The embelishment of this general type of goods is effected by dyeing skeins of filling yarns in two or more colors. These yarns when woven in the goods produce alternating effects at regular distances in different colors, and in combination with striped warps. The effects are many and varied. Skeins of yarns of different lengths are reeled, and dips of all sorts and sizes are made to suit the requirements of the trade. The simplest form is to use the regular standard length skein, white or colored as a base; and then dip a given portion of it another color; which is done by hanging the skeins on sticks placed in a rack fixed at the required distance above the color liquor, and then dyeing the immersed part in the usual manner. For making very long plaid effects, specially reeled long skeins are used,

which it is not practicable to handle in the regular manner at the dye boxes. Wood clamps are made, into which parts of these skeins are carefully folded and laid, and then clamped tightly in such a manner that the dye liquor cannot penetrate into the clamped up part of the skein, while the part to be dyed is left outside of the clamp. The whole is then immersed in the dye liquor, and only the part outside the clamps will be dyed. Figs. 30 and 31 show the style of clamp used for this purpose.

Filling yarn printed in the skein is also used in producing fancy effects on plain goods, although this field is comparatively limited in scope. This method is also somewhat expensive, as only one skein can be handled at a time in the printing machines. The machine used for this purpose has a pair of brass printing rolls, which are both grooved across their face at given distances, according to the pattern required. One of these rolls is fixed, while the other is hinged at one end, and made to swing open in its bearings like a gate to allow for the insertion of the skein between the two rolls for printing. The fixed roll is fed with ink, and the ink uniformly distributed over the roller, in the usual manner employed in regular printing machines. When the skein is inserted between the two rolls, and the gate closed, one revolution of the skein is made by hand, which prints it; the gate is then opened and the skein taken out, after which the color must be fixed in the bath.

A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

(D) REFORM WEAVES IN WHICH THE FILLING THREADS ALTERNATE ON FACE AND BACK

These weaves are obtained by turning the reform weaves already described so as to bring the side at the top of the draft, making the risers sinkers and the sinkers risers. Fig. 1233 shows such a reform weave obtained by changing Fig. 1188, the ground weave being a 4-leaf twill, Fig. 1187.

FIG. 1234

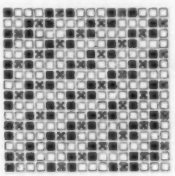


FIG. 1235

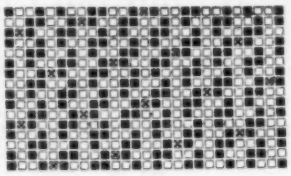
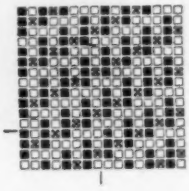


FIG 1236



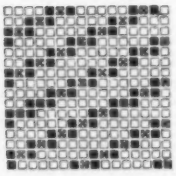


FIG. 1237

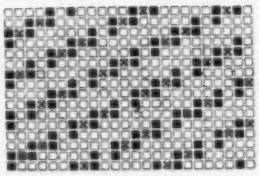


FIG. 1238

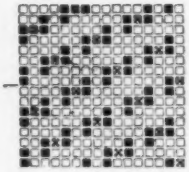


FIG. 1239

BACK WARP FABRICS

Weaves with an extra set of warp threads on the back are used for increasing the weight of fabrics of various kinds. If a face thread alternates with a back in the warp, the set is called 1 and 1. If there are 2 threads on the face to 1 on the back the set is 2 and 1. If a warp satin is used for the face and a filling satin weave for the back, the warp being dressed 1 gray, 1 white, the face of the cloth will be gray and the back white.

These weaves are not suitable for heavy woolen cloths as the necessarily close set of the warp makes it difficult to form a good shed with coarse woolen yarn. They can be used for medium weight woolen fabrics, 18 to 20 ounces per yard, 55 inches wide, but

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for heavier cloths the back filling answers much better for adding weight, as the number of picks can be increased more easily than can the threads in the warp, and a much closer face can thus be obtained. The

FIG. 1240

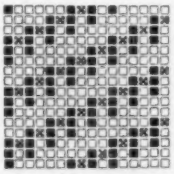


FIG. 1241

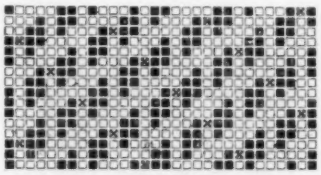
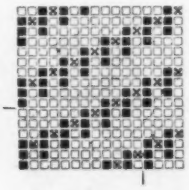


FIG. 1242



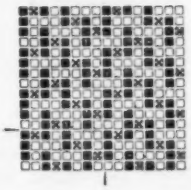


FIG. 1243

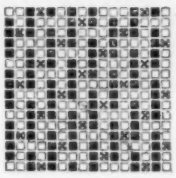


FIG. 1244

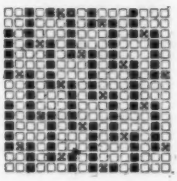


FIG. 1245

back warp weaves answer very well, however, for fine worsted for men's wear, in which as many as 10,000 or 12,000 ends are sometimes used for 6/4 cloths.

In drafting back warp weaves the first rule to be observed is that the riser of a back thread should have the face warp raised on each side of it. It is sometimes necessary to vary the regular order of stitching the back to prevent single risers from coming next to single sinkers and causing an irregularity in the fabric. Figs. 1234 to 1260 illustrate various forms of these weaves.

Fig. 1243 shows a 3 up 1 down broken twill on the face with a back warp. The warp is dressed 1 back 1 face. The back warp is woven with a 1 up 3 down broken twill. This makes the appearance of the back and face the same. The back and face weaves must be adjusted so that no single stitcher of the face warp comes next to a single stitcher of the back warp. This is possible with only one of the four possible combinations. This weave is used for hair

FIG. 1246

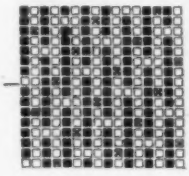


FIG. 1247

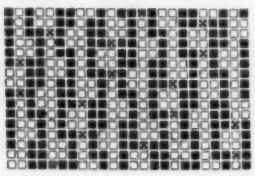
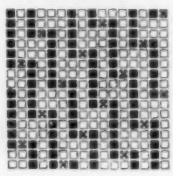


FIG. 1248



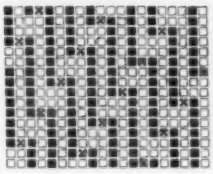


FIG. 1249

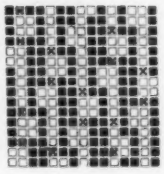


FIG. 1250

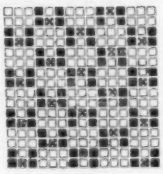


FIG. 1251

line effects, which are obtained by a suitable arrangement of colors in warp and filling to make a continuous warp line.

Fig.

1234, 1 and 1, face 2 up 1 down twill, back 1 up 2 down twill.

FIG. 1252

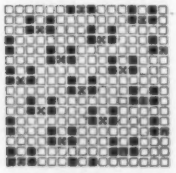


FIG. 1253

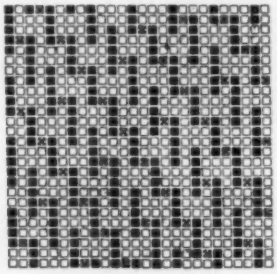
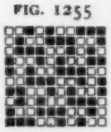


FIG. 1254

FIG. 1255



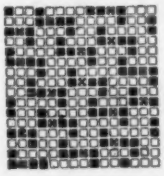


FIG 1256

1235, 2 and 1, face 2 up 1 down twill, back 9-leaf satin.

1236, 1 and 1, face 3 up 1 down twill, back 1 up 3 down twill.

1237, 1 and 1, face 2 up 2 down twill, back 1 up 3 down twill.

1238, 1 and 1, face 2 up 2 down twill, back 12-leaf.

1244, 1 and 1, face 5-leaf satin, back 5-leaf satin.

1245, 1 and 1, face 7-leaf satin, back 7-leaf satin.

1246, 1 and 1, face 8-leaf satin, back 8-leaf satin.

1247, 2 and 1, face 8-leaf satin, back 16-leaf.

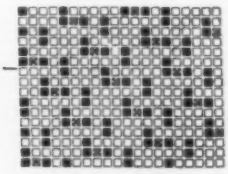
1248, 1 and 1, face 8-leaf satin, back 8-leaf satin.

1249, 1 and 1, face 10-leaf satin, back 10-leaf satin.

1250, 2 and 1, face 10-leaf satin, back 10-leaf.

1251, 2 and 1, face 4-leaf basket, back 1 up 3 down broken.

FIG 1257



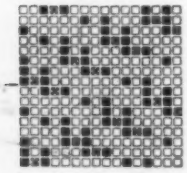
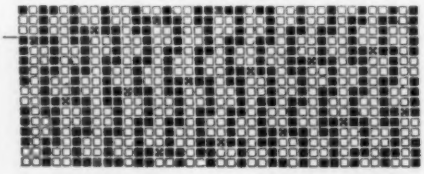


FIG. 1259

FIG 1258



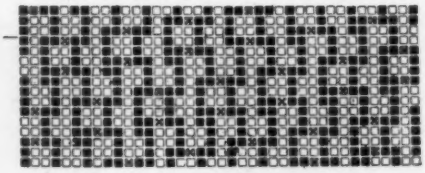


FIG. 1260

1239, 1 and 1, face 2 up 2 down twill, back 8-leaf satin.

1240, 1 and 1, face 3 up 2 down twill, back 1 up 4 down twill.

1241, 2 and 1, face 3 up 2 down twill, back 10-leaf satin.

1242, 1 and 1, face 3 up 3 down twill, back 1 up 5 down twill.

1243, 1 and 1, face 3 up 1 down broken, back 1 up 3 down broken.

1253, 1 and 1, face Fig. 1252, back 8-leaf satin.

1254, 1 and 1, face 13-leaf twill rib, back 26-leaf.

1256, 2 and 1, face Fig. 1255, back 10-leaf.

1257, 1 and 1, face Fig. 1255, back 10-leaf.

1258, 2 and 1, face Fig. 472, back 13-leaf.

1259, 1 and 1, face Fig. 1028c, back 8-leaf.

1260, 2 and 1, face Fig. 472, back 13-leaf.

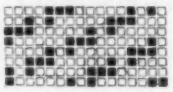
Fig. 1243 is well suited for kersey fabrics. The warp for kerseys is set closer than the filling in order that the nap may be raised mainly from the parallel fibers of the warp and thus produce a smooth effect lengthways of the piece.

Hair lines on the contrary are generally sheared close and a sandy feel is desired. For this reason the warp and filling are more nearly balanced. The following layouts for a kersey and a hair line, both woven with Fig. 1243, will illustrate the difference in the proportion of warp and filling:

Kersey

Warp, 88 ends per inch finished.

FIG. 1261.



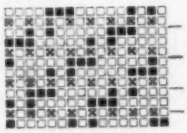


FIG. 1262

Filling, 67 ends per inch finished.
21 threads (33%) more per inch in warp than in filling.

Hairline

Warp, 70 ends per inch finished.
Filling, 65 ends per inch finished.
5 threads (8%) more per inch in warp than in filling.

By turning Fig. 1243 one-quarter around the back filling weave shown at Fig. 1283 is obtained.

The drawing-in draft for a back warp weave is arranged to bring the back threads on the back shafts and the face threads on the front shafts nearest to the reed; see Figs. 25 and 26. When weaving cloth with a worsted face warp and woolen back warp, it is a better plan to reverse this order, bringing the back warp on the front shafts nearest to the reed.

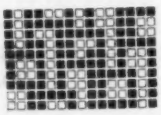
Every filling thread should be stitched by the back warp in these weaves; this is necessary that the picks may be held in the same position and the face remain smooth and uniform.

STUFFING PICKS

It is sometimes necessary to introduce stuffing picks in worsted fabrics to obtain sufficient weight. A stuffing pick is woven so as to lie between the face and back warp in the center of the fabric. The usual order is 2 face picks 1 stuffing pick. When the stuffing pick is woven, all the face warp threads are raised, and all back warp lowered.

Fig. 1262 shows Fig. 1261 woven with a stuffing pick, the warp being dressed 1 face, 1 back.

FIG. 1263



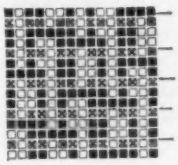


FIG. 1264

Fig. 1264 shows Fig. 1263 woven with a stuffing pick, the warp being dressed 2 face, 1 back.

The stuffing picks are indicated by the lines at the side of the drafts, Figs. 1262 and 1264.

BACK FILLING FABRICS

Back filling is used to make cloths thicker and heavier. It also enables the cost to be reduced by the use of cheaper material on the back. For this purpose the back filling is usually spun heavier than the face filling or warp. If, however, the difference between the size of the face and back filling, woven 1 and 1, is too great the face will be injured, as the coarse backing will prevent the filling threads from lying close together to form a smooth face. This difficulty can be remedied only by weaving two or three

face picks to one back pick. Even then there is a limit to the size of the back filling that can be used.

—÷—

CAUSES FOR DEFECTS IN SILK

BY SWANSEA

Dyed silk, as is only too well known, presents numerous and peculiar defects that are troublesome propositions to the silk manufacturer or dealer. There may be cited in the line of skein silk, such troubles as fuzziness of the yarn, which is due to either the fiber being cut while running through the guide-eyes in the throwing process; to the over-working in the dyeing; or to the lousiness of the raw silk. These are the most common causes. In most instances the fuzziness does not show up until after being dyed. The direct cause of this trouble can then be determined by suitable tests. The most frequent cause is lousiness of the raw silk, resulting from a disease of the worm which spins its silk and deposits bunches along the fiber.

Unevenness of color can often be attributed to uneven weighting, uneven distribution of the dye, or variation in the size of the raw stock. There may be substances introduced into the silk before which will not come off in the usual boiling off or degumming process. If a piece of shady silk is submitted to a chemical test or analysis the percentage of dye, amount of weighting and other substances can be determined and the cause of the defect will be apparent. The throwster may use an excessive quantity of oil and soap or even grease which is fixed in variable proportions on the fiber in the dyeing process. This may often cause the dyer a great deal of trouble and cause streaked silk, either directly by not taking the dye even or indirectly by causing overworking of the silk to obtain the desired shade. The oil, soap and grease present can be determined and the manufacturer should have his thrown silk inspected or analyzed before being sent to the dyer. I knew of a case where raw silk that happened to be a fine large thread was found to be treated with rice powder to make it bulky when in reality it was found to be a very slender fiber. An excess of fat may be present on the raw silk and not only cause trouble in subsequent operations, but cause the buyer to pay for this fat at the rate of $3 to $4 a pound. Some silk has been known to contain over 8 per cent. of fat, as against the normal 1 per cent. contained in the original fiber. The percentage of ash from silk is of some consequence as it shows the amount of mineral matter present. If the percentage of ash is above the normal (1/2 per cent. in the case of raw silk) it shows that there is a mineral loading present. Nearly all the troubles encountered by manufacturers, dyers, finishers and throwsters can be determined and the cause of the defect traced to its proper source. The manufacturer should protect himself by having all raw, thrown and dyed silk analyzed before accepting it as a good delivery.

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A SUBSTITUTE FOR JUTE

About a year ago the foreign press gave wide publicity to what was called a process for converting straw into fiber for manufacturing fabrics. In reply to our request for a more detailed account of the product, the Gesellschaft fuer Veredelung und Verwetung von Faserstoffen, which controls the process, calls attention to the remarkable advance in the price of jute, which has doubled in the past twelve years, and then refers as follows to the straw product, which is used as a substitute for the jute fiber:

"It is only natural that in countries with a large consumption of jute, ways and means are being devised to replace this material by another, the supply of which is not limited to one country only. Up to now the results achieved in this direction have been very disappointing and only a paper composition called textilose has a chance of being used as a substitute for jute in a limited way. Quite lately, however, a new material, straw-fiber called stranfa has been produced, which bids fair to revolutionize the market. Stranfa is produced from straw by an ingenious chemical process, the invention of a German textile expert. In appearance it is very similar to jute, and only a clever ex

pert would be able to detect the existence of straw-fiber in piece goods made from a mixture of this material and jute. For technical reasons it has been found advisable to add a certain percentage of jute to the straw-fiber on account of the shortness of the latter, especially when machine straw is being used. The process of converting straw into fiber is very simple and inexpensive and the fiber itself is treated in the same way as jute, that is, batched, softened, carded, stretched and finally spun. The cost of the fiber comes to about $40 a ton exclusive of the royalty, which compares with about $136 a ton, the present price of jute.

"Stranfa has been used for the manufacture of string, cord and rope, also piece goods and sacking and although only limited quantities have so far been available, those who have tried it are unanimous in pronouncing it to be an ideal substitute for jute and quite equal to it in strength. It is remarkable that the waste in the manufacture of stranfa is not any greater than when using jute. Another advantage of stranfa is the possibility of working it up by ordinary jute machinery, so that the whole industry will be able to adopt stranfa without having to make any alterations in the existing plant. The chemical process has also been tried with other vegetable fibers such as reed grasses of all description, aloe leaves and others and the results achieved have been most satisfactory, as in every instance a strong and serviceable fiber has been produced.

The chemical process as well as the machines used have been patented throughout the world.

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The history of modern alizarine dyes dates from the discovery by the Farbenfabrik Co.

A CLEARER FOR SPINNING MACHINES

The clearer shown in the accompanying illustrations has recently been patented in this country and is described by the inventor

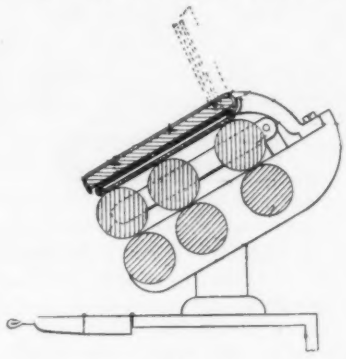

FIG. 1

as follows: The object of the invention is to provide an improved clearer, which can be readily lifted to permit the accumulation of lint to be cleaned from the wipers, or to allow of access to the rolls of the machine.

Fig. 1 is a cross section taken through the rolls of a spinning machine, equipped with the device. Fig. 2 is a botton plan view of the clearer. Fig. 3 is a section on the line 3—3 of Fig. 2.

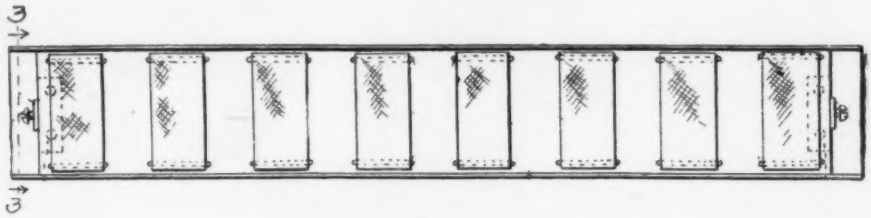

FIG. 2

The bottom and top rolls are shown in Fig. 1, supported in the usual stand. Secured to the stand are the clearer stands consisting of a curved arm having a perforated base secured to the stand by bolts. Each of the stands have curved lugs at their outer or free ends for engagement with the inner faces of the ends of the curved outer side of the metal base of the clearer. The stands are provided with pins and curved lips, arranged to receive the ends of the opposite curved side of the base, the pins engaging the inner faces of the ends of side, and the

lips being disposed on the outer faces of ends of the side.

A wood board is arranged in the base between the sides and has screws secured to its ends, the screws passing through slots provided in lugs formed on plates that are riveted to the metal base by which means the board may be removed and replaced. The

FIG. 3

wipers are formed of endless bands of heavy fabric that extend across the clearer, each of the wipers being mounted on a pair of parallel U-shaped rods, the free ends of which rods are driven into the board. The clearer is supported at its ends and may be readily removed or turned upwardly as indicated in dotted lines in Fig. 1, to permit the accumulation of lint to be picked from the wipers. When the base is brought to bear on the upper end of the lip the latter will support same against further outward movement.

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To Pliny Earle, of Leicester, Mass., undoubtedly belongs the honor of making the first machine card-clothing in the United States. This he did for Samuel Slater.

WATERING EGYPTIAN COTTON

This photograph was taken by a member of the delegation of cotton spinners which recently visited Egypt. It forms the frontispiece of the official report of the Conferences held in Egypt in October and November last in connection with the International Federation of Master Cotton Spinners' and Manufacturers' Associations.

No secret is made of this watering process, as the export merchants at Alexandria maintain that the extra addition of water is good for the cotton. The spinners at the Alexandria Conference did not accept that view, as is quite clear from the verbatim report of the Conference. It must be remembered that virtually all the Egyptian cotton is watered twice in the manner shown in the photograph, first at the ginnery and secondly at the press in Alexandria. While an excuse can possibly be found for the first addition of water after the ginning, as the cotton in that process loses a certain amount of moisture, no explanation will hold good for the second watering at the press. Several spinners' delegates were assured by practical men, whose lifelong work has been the superintendence of ginning factories, that there is not the slightest mechanical

WATERING OF COTTON AT ONE OF THE LARGEST PRESSES AT ALEXANDRIA.

difficulty in pressing the bale to the usual density of the Egyptian cotton without the addition of water. One of the speakers at the Alexandria Conference pointed out that the density of the Indian bales is much greater, and that water as a rule is not used in India for pressing purposes. The air in Alexandria during the season when cotton is being pressed is very humid indeed. The International Cotton Federation will do well to take this matter energetically in hand, as the spinning industry must lose many thousands of pounds per annum through this watering of Egyptian cotton.—The Manchester Guardian.

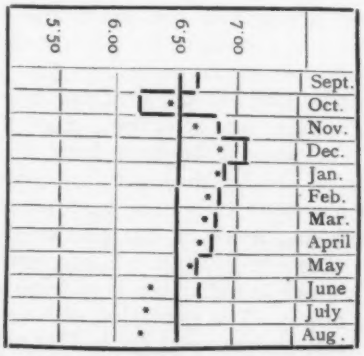
ENGLISH NOTES

By Our Regular Correspondent

Textile business is still brisk, but not so lively as it was and the oracles who say that we are past the top of the boom may be right. Large harvests, easier money and easier prices are wanted and the immediate future is dependent upon these. The American tariff situation still occupies a back place in English calculations and although there has been grumbling about the trouble of doing business with the United States, returns for the half year show no very great falling off in manufactures in comparison with 1912. The heavily reduced takings of wool for America are no misfortune at all in the eyes of those who have found wool too dear. And cotton lining makers have had compensation for the 50 per cent. fall in their article. Business in worsteds has been a little larger than a year ago and in woolens has been barely less, but uncertainty impedes the way forward. A large increase in exports is still expected under a tariff of 35 per cent. and on the whole delay is likely to enable English manufacturers better to meet a sudden demand. Of one thing American manufacturers may be certain. They will find English mills offering a much larger variety of goods than in the last free-wool period. Some of these may prove quite unsuitable to American taste, but variety has its attractions not less potent than those of price. Woolen and worsted goods are not relatively cheaper than in 1896, but dearer, and in them as in fancy cottons the assortment is immensely larger.

* * *

All that the cotton market asks of a prophet is that he should be right in his forecasts, the method used in arriving at them is regarded as principally the prophet's own affair. The private statistician who compiles the Wallis cotton circular uses as the base of his calculations an index number designed to reflect the changes in the gold standard. This calculation, which is made once a year, and is combined with certain other factors not specified, provides the material for an estimate of average prices of cotton. These give some means of judging whether prices



Thick Curve—Average price for season to date.
Thick Line—Estimated average.
Stars—Estimated course of prices for season.

are above or below a normal expectation. In the last four years the anticipations have consistently been below the actual average and, owing to sudden movements, have sometimes been far from the extremes, but they have been within hailing distance of the fact. The subjoined shows the record:

	Price		Range	
	Est.	Actual	High	Low
1909-10	7.80	7.85	8.50	6.77
1910-11	7.40	7.91	8.42	6.57
1911-12	5.60	5.91	7.53	4.92
1912-13	6.50	6.80*		

* To date.

On the principle that the area planted is determined by the price paid for cotton the index is used to estimate the probable increase. In two out of the last three seasons the calculation proved correct and last year

the forecast of a decrease of 3 per cent. or more was followed by an actual decrease of 7 per cent. The author, who is a heretic upon the influence of supply and demand in fixing prices, continues his arguments from month to month and gives the accompanying chart of spot cotton prices (English) for the year.

* * *

For marine fiber (Poseidonia Australis) present quotations are £25 per ton in England, or approximately 6 cents a pound. A couple of hundred bales of some 200 lbs. each have been up at auction. The material has been used experimentally, at least, in carded woolens, and although exact particulars are lacking, it would be safe to count upon an appreciable loss upon the cards. The fiber was associated for a while with the paper-yarn manufacture and, now that it has come again upon the open market, might be supplied at the rate of perhaps 2,000 tons a year. The fiber is dredged from the sea-bottoms off the South Australian coast and the samples of it seen have been unmistakably salty and more or less encrusted with shells. According to some accounts the fiber, although found at sea, is of fresh water or land origin. The quotation of 6 cents is higher than the material fetched at auction last year and higher than the valuation put upon it by a Yorkshire firm of woolen manufacturers who used some of it upon its first appearance. While the available supply is believed to be large, its extraction from the sea and its washing upon pontoons is difficult in bad weather and expensive.

* * *

A published statement which cannot be thought to err upon the side of moderation says that eleven Huddersfield firms manufacturing high-grade plain and fancy worsteds spend annually $500,000 upon new patterns. Huddersfield worsted manufacturers as a whole are said to spend $750,000 in this way. This outlay is undeniably a large one, but it is the common habit of worsted manufacturers in Yorkshire to reckon "patterns and selling" together as one charge and in default of clear testimony to the contrary it may be assumed that the items have been bulked in making this calculation. In any case there are conspicuous inconsistencies between the statements made by manufacturers at different times. The largest Huddersfield mill boasts of spending $100,000 a year on patterns, which in round figures means $250 a loom. The head of the second largest mill, manufacturing goods of the same quality and style, and in similar quantities to one pattern, gave a statement a few years ago which indicated an outlay of $150 to $200 per loom per annum.

* * *

The demands of Bradford weavers for higher wages has directed attention to the widely differing earnings in different mills. So many classes of weaving are carried on in the district that an average is particularly hard to strike. Most weaving is done on the two-loom system and a manufacturer weaving botany twills has tabulated the earnings of 16 two-loom weavers over a period of twelve weeks. The highest individual average was $6.40 and the lowest $4.55, with $5.22 as the average for all weavers. James Drummond & Sons, who make a line of worsteds known well in America, state that the average earnings of all weavers in their shed have been $4.76 in one week and $4.68 in the next. Their weaving is mainly done by girls tending one box-loom and their best hands make regularly from $5 to $6.75. In the best dress goods mills competent weavers make their $5 or more and the demand is in excess of the supply. The statements give an idea of present payments in the higher branches of Bradford business. In the lower branches comparison is complicated by the existence of many bad weavers whose earnings are materially less than those of the menders who repair their mistakes. Commission weaving mills are a great refuge of the inefficient, but even in Bradford it is possible to get cloth well woven on commission and some high-grade goods are put upon the market by firms who never owned a plant.

* * *

The Royal Agricultural Society, as the chief association of English agriculturists, exercises a general supervision over farming affairs at large. It holds the chief show of livestock and at Bristol brought together a

collection of the primitive British breeds of sheep, including the St. Kilda, Shetland, Manx, Hebridean and the old Horned Wiltshire and Norfolk. Crossing experiments are being tried with these and others, with an eye to new types of great hardiness. The Society is considering the appointment of a wool expert to whom growers can apply for unbiased advice upon questions affecting the value of wool. The cooperation of Bradford manufacturers has been promised in advance and it may be hoped that an appointment will be made. Manufacturers and experts can give advice of value to the breeder and grower, but sheep men are not to be converted to new opinions in a day. A few particulars of three flocks which are being sold this July will show how deeply-rooted in the past is the English sheep-breeding industry. The Riby Lincolns of the late Henry Dudding have a record of 160 years and comprise some 2,000 animals, blood relations of prize rams that have brought up to $7,500 at auction. The Babraham Southdowns of Mr. Adeane have been a flock upon their present soil for over a hundred years and their ancestors were here probably before the Roman occupation. The Chilmark Hampshire Downs were found in 1840 and have brought their owners 641 prizes.

* * *

The great vogue of the Bedford cord in fabrics as diverse as white cottons and blue worsteds has recalled an item of forgotten history. Woolen Bedford cords for riding breeches have been made continuously for probably a century and in the 1830s a London woolen merchant conceived the idea that a diagonal Bedford would sell. The idea was given to Jonathan Schofield of Rastrick who put a double woolen warp into the loom and wove it with a ten heald rib, afterwards changing this to five healds. Thus—at any rate in one quarter—was born the doeskin now an almost forgotten article in English trade, although at one time a staple of great importance. The doeskin was one of the woolen fabrics superseded by the clay worsted. The facts as to the introduction of that article are well attested, although but little known. The twill merino worsted grew out of the fancy vesting trade. In 1853 John Beaumont of Dalton had been making a Berlin vesting of 4/4s woolen yarn twisted with a thick thread of silk. A woolen merchant proposed the substitution of worsted. Clay of Rastrick accepted the suggestion. From a black vesting woven in chessboard squares of twill and hopsack, the tailor Poole made a coat and cutting out one of the twill squares from the cloth ordered a piece to this pattern in double width. From this a coat was made for the Prince of Wales and worsted came into fashion with results highly detrimental to the carded woolen trade. The year 1857 or 1858 was the time of this development and in the seventies the corkscrew came in and completed the rout of the melton, beaver and doeskin.

* * *

Now that the cotton grown in new fields under the auspices of the British Cotton-growing Association reaches 76,490 bales of 400 pounds each, the Council feel that the 100,000 bale mark is within easy distance. Comfort is drawn from a reflection that the progress of Empire cotton growing is "very much greater than was the case in the early days of cotton growing in the United States." The amount has improved from 20,000 bales in 1908 and it would seem from British records that cotton came slowly from America. The business began in 1791 with an export of less than 200,000 pounds and did not reach 5 million pounds until 1795, two years after the introduction of the Whitney gin. The Association has had a slow and painful time in finding out where cotton cannot be grown and in conjunction with its subsidiaries has invested over $5,000,000. Another $1,250,000 is to be raised as soon as the small balance of the original capital has been subscribed and the new funds are to be upon a commercial basis and be used in earning interest as advances to planters. Commissions are already earned upon the supply of machinery and seed and on the sale of raw cotton and the opportunities for employing new money have been visibly increased by the Government loans for irrigation in the Sudan and the improvement of transport in Uganda.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

FINISHING MADRAS SHIRTING

Editor Textile World Record:

Under separate cover I am sending you a sample of Madras shirting. We have had considerable trouble with this fabric on account of excessive shrinking in the garment. We make some allowance for that in cutting the patterns, but it is so excessive in this cloth that after the shirt is washed it is much too small. The shrinkage amounts to about 3 inches in width and 4 inches in length. Can you tell me why this cloth should shrink so much more than the ordinary fabric of its class? Mantell (2182).

The sample of madras shirting submitted is a very coarse cloth for this class of shirting. The trouble is due to the extreme finishing of the fabric. The cloth as it is finished had 60 warp threads and 48 picks to the inch. The yarn is not a very good quality for a shirting. In testing the sample I find that there is considerable shrinkage. After the shrinkage has taken place there is a difference of 8 warp threads and 4 picks per inch. This shows that the trouble is in the finishing. On the other hand, if a manufacturer wants to produce a cheap shirt he must adapt himself to the material he is using, for he cannot get a good unshrinkable shirt out of material of a low quality. The fact that the cloth shrinks both ways, shows that it has been finished under tension, having been passed over a tentering machine twice to obtain the desired width. Every finisher knows that he cannot get a gain both ways and that if he finishes a piece of cloth to its woven width, it will shrink to the natural width during the bleaching and finishing process. If a cloth is woven 40 inches wide and finished to the same width it will shrink to its normal width and show a loss in length. If a fabric is woven 40 inches wide and is finished to 36 1/2 or 37 inches, it will show a gain in length, but will show a very slight shrinkage when cut up and converted into shirts. I have watched batch after batch of goods and found that there is almost always a loss on the lower qualities, while on the better grades show a good gain, besides having very little trouble with the shirt makers.

In manufacturing our shirtings we allow from 2 to 3 inches for shrinkage in the finishing process on our high grade goods, and allow from 3 1/2 to 4 1/2 inches for shrinkage on our low grade. Our high grade shirtings we weave from 38 to 39 1/2 inches wide and finish to 36 or 36 1/2 inches; the lower qualities we weave 39 to 41 inches and finish to 36 or 36 1/2 inches. When these goods are cut up and made into shirts there is very little shrinkage. It is not to the advantage of the manufacturer to finish goods to the limit of width. There is more or less loss on account of damage which occurs at every flaw in the weaving; there will be a loss in length, and there is trouble with shrinkage after the material is made up into garments. I had trouble at one time with some interlining. The facings and cuffs of the material had shrunk the average amount, but the interlining had not shrunk in comparison with the facings, thus leaving creases under the material. The buyers claimed the goods were seconds and our firm had to buy the whole lot and dispose of them as best they could. This resulted in changing the finish on the interlining so that the shrinkage would be the same as on the facings. It took considerable time to obtain this result, but eventually we got there and I have had very little trouble for some time.

The only remedy for "Mantell's" difficulty is to make a greater allowance in cutting the patterns for the shirts. The shirt makers will object for it will take more material to make a shirt. The manufacturers must

make the goods wider to finish at the present width, or the finisher must not stretch the materials so much in the process of finishing. Delco.

The sample of madras is very open in both warp and filling. Such a fabric will show such a tendency to shrink when weaving that it will be necessary to adjust the temples to hold the selvage firmly in position. It will also be necessary to make the cloth wider than usual in the loom in order to avoid the subsequent shrinkage and to relieve the strain on the temples. I have encountered this difficulty with shrinkage in weaving cloth on looms in which the take-up motion takes the place of the breast beam, as the cloth does not have an opportunity of shrinking between the reed and the take-up roller. It is quite probable this sample of madras was made in that way. There is no other remedy for the difficulty than to reed the goods wider in the loom. Gaul.

It is a well recognized fact that open textures shrink more than goods that are closely woven. Published data on this question of the shrinkage of cotton fabrics are scanty, but an idea of the variation in shrinkages can be got from Herzfeld's records. Cotton goods bought by the German Government were placed in hot water, left over night and dried without stretching at a moderate temperature. On the next day it was found that drills shrunk 4 to 5 per cent. in length and 1 to 2 per cent. in width, linings shrunk 8 to 10 per cent. in length and 3 to 4 per cent. in width, fustian shrunk 2 to 3 per cent. in length and 1 to 2 per cent. in width, calico, for invalids' shirts, shrunk 3 to 4 per cent. in length and 1 to 2 per cent. in width.

The allegation is that the particular sample which counts 12 x 15 to the quarter-inch shrinks much more than the ordinary fabric of its class. To determine the point a sample was submitted to an independent institution in Manchester for an expression of opinion. Under the tests there applied the loss in length was found to be 5 per cent. in the warp direction and 8 per cent. in the filling direction. These amounts are not regarded as at all unusual in cloth of similarly open structure. The inference seems to be that "Blackpool" is comparing his sample with cloths having more threads to the inch.

Regent.

BOILING-OFF SILK WASTE

Editor Textile World Record:

I am sending a sample of gum silk waste and gum hosiery clips. Would you please advise us as to the best method of removing or boiling out the gum and how to dry the stock after boiling off. If possible advise as to what preparation or bath is used. Delmar (2178).

This material is best handled by boiling-off in the following manner: The silk is placed in bags made of loosely woven cotton material, and hung in a soap solution of such strength as will soften and dissolve nearly all of the silk gum, when the bags are removed to another bath containing soap in a different proportion, and where the final operation or degumming takes place.

The first soap bath is made up as follows: The bath should contain about three gallons of water for each pound of silk. The amount of soap should be 2 pounds for each 10 pounds of silk, although some silks require as much as 3 pounds. The silk is entered, and the temperature brought to as near 200° or 205° F. as possible, and kept in slow motion for an hour, during which time the silk gum gradually swells, becomes sticky and finally dissolves. As the silk is in bags, it is not possible for it to receive the same saturation with the soap liquor, but this is overcome by giving a longer time in the bath. As a rule two or three hours are not too long for the first bath. After lifting from this bath, the bags are either squeezed, or better whizzed, and then entered into the second bath which is made up with the same amount of water as in the first bath, together with 1 1/2 pounds of soap. Next comes working the silk at the same temperature for 1 1/2 to 2 hours, afterwards lifting out and allowing to drain, and finally passing through a bath containing 2 ounces of sal soda per gallon. The silk is then washed well.

This treatment will give a first-class boiled-off silk, free from undissolved gum or remaining traces of soap, if ample time has been given to the operations.

Drying is best effected by spreading the

wet silk evenly over wire screens, through which heated air is forced by fans. A good apparatus for this work is the old style wool dryer. Where a large quantity of silk is to be dried, of course, a special continuous dryer is to be preferred. L. J. Matos.

SIZING BLACK COTTON GOODS

Editor Textile World Record:

Will you kindly advise us how to size ordinary black cotton goods so as to get a very stiff finish like the enclosed sample, even stiffer if possible. We can dispense with the glossy calender finish that is on the sample, but the stiffness is what we want. We have only an ordinary starcher and a set of drying cans to work with, but think these would suffice if we could get the proper sizing mixture. We also find that black goods after starching come up very greyish looking. Perhaps you can advise us what to put in the size to avoid this. Knickerbocker (2171).

Our French correspondent replies to this question as follows: The formula for the finish on the sample enclosed with your inquiry is as follows:

Fecula	parts	17 1/2
Cornstarch		12 1/2
Tallow		2 1/2
Cocoa butter		1
Carbonate of soda		1/4
Extract of logwood		80
Bichromate of potash ...		1/50

Add water to make 500 parts by weight and boil 30 minutes. The extract of logwood is prepared by boiling 50 parts of chip logwood in 300 parts of water. To give the required stiffness the cloth should be starched on both sides, then dried on a cylinder drying machine. It is then moistened slightly and starched a second time on both sides, after which it is again dried. After drying the cloth is moistened, then left for 24 hours when it is calendered. Gaul.

I would recommend the use of the following finishing paste for sizing black cotton goods:

50 lbs. Corn Starch.
1 qt. Oleine Oil.
2 lbs. Glue.
2 lbs. Tallow.
1 lb. Soda Crystals.
½ pt. Carbolic Acid.
1 lb. Chrome.
½ lb. Bluestone.
2½ lbs. Logwood Extract, solid.
Water sufficient to make up 50 gals.

The starch is boiled up as customary in a starch mixer together with the oleine oil, and the glue solution may be added. The tallow and soda crystals are boiled up together and the emulsion is then added. The logwood extract should first be dissolved in water and added to the mixer. Then the solution of chrome and bluestone may be added. The carbolic acid is added as a preservative to prevent fermentation or mildew.

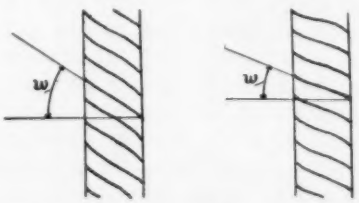
The trouble experienced by "Manhattan" in having black goods come up greyish looking after sizing, is either due to the fact that he has used no black dyestuff to color the size or has used china clay in considerable quantity, which will come up white on calendering. The use of the logwood in connection with the chrome and bluestone produces a black dye which will color the starch and thus prevent the greyish looking appearance of the size and finishing cloth. J. M. Matthews.

CONTRACTION IN 2/40s COTTON YARN

Editor Textile World Record:

We have a customer calling for 2/40s yarn, 30 turns to the inch. Please advise us what the size of this yarn should be after twisting? What is the customary allowance for contraction on counts ranging from 10s to 40s, where there is such hard twist as mentioned above? Melvin (2195).

The "Leipziger Monatschrift fuer Textil Industrie" recently published the following answer to a question regarding the size of a single yarn required to make a 2/40s equal



to single 20s. If the count of the 2 ply yarn is to be exactly double that of the single yarn; for example, if 2/40s is to equal single 20s, the spun count of the single yarn must be somewhat finer than double the count of the ply yarn. How much finer depends en-

tirely on the kind of twist, that is, on the amount of twist in the ply yarn. The harder the ply yarn is twisted the coarser will be the count. With hard yarn the turns lie flatter than when the yarn is soft twisted. This difference is shown clearly in the accompanying illustration of two threads, one twisted hard and the other soft. It is clear that a greater length of single yarn is necessary to produce a given length of ply yarn if the latter is twisted hard than if twisted soft. This fact is well illustrated when taking twist out of ply yarn by means of a twisting counter. As the twist is removed the ply yarn becomes slack. The smaller the angle, w, in the illustration, the heavier will the ply yarn be for the same size of single yarn.

COMPARATIVE FASTNESS OF DYEING WOOL AND COTTON

Editor Textile World Record:

I would like to have your opinion as to the comparative fastness of black and other colors on cotton and wool. I have been informed that it is not possible to get a color on cotton as fast to light as on wool. Canton (2189).

This is a very broad question and cannot be answered in such a way as to give "Canton" proper satisfaction. To compare blacks on cotton, for example with blacks on wool brings forward the question as to "how" they were each severally dyed, and what kind of blacks were used. In general, it may be stated that there are colors that can be dyed on cotton that are equally as fast to light as the same colors dyed on wool. No reference in the above statement implies any specific class or brand of dyes as distinguished from colors. Two dyers may, and probably will, produce a given shade of color on the same grade of stock with entirely different dyes.

There is no doubt but that a skilled dyer, one who knows the possibilities and limitations of the various classes of dyestuffs, and is familiar with the processes of applying them, will have no difficulty in duplicating on cotton, any shade submitted on wool, whether the desired shade be black or colors.

As the term "fast" is relative and greatly misused, it becomes necessary to comprehend what is meant by it in common use. A mill may be turning out a range of shades of a "degree of fastness" that meets the requirements of its customers, and afterwards, in response to a certain demand for "increased" fastness, makes use of dyes that yield "faster" shades, but these latter shades may be far from "fast" in the strict sense of the word.

Beta Napthol.

It is a well known fact that colors are not as fast on cotton as on wool because wool has an affinity for colors that cotton has not got. In regard to blacks on cotton, fast blacks that are practically indestructible have been dyed for years. These include the oxidized aniline black, a process of dyeing which is fast against light and washing and which will last as long as the fabric itself when properly dyed on pieces and hosiery.

Very fast reds on cotton are obtained by the alizarine red process of dyeing, both on piece goods and yarns, but owing to the numerous operations and the lengths of time used in dyeing it does not meet with popular favor. There is also another objection to the use of this process for warp dyeing. The oil and alum have a tendency to make the yarn sticky in the beaming process. Many do not like it on that account, but the red obtained is fast to light and washing and will last for years. Indigo can also be dyed very fast on cotton if the operation is not hurried too much. This is true of many other colors which can be dyed on cotton, but generally speaking colors dyed on wool are faster than the same colors on cotton. This difference in relative fastness is not so great as it was, owing to the many discoveries of the so-called vat colors. From these colors it is possible to select shades which are as fast as any color can be on wool. I have seen reds dyed with Algol red which after several months' exposure to light showed no perceptible change. This is also true in regard to a khaki shade dyed on piece goods with a combination of Algol Olive, Algol Brown R and Algol Olive R. Algol Brilliant Violet R and Algol Brilliant Orange are fast to light and washing and many of these colors are fast to bleaching, either with chlorine or hydrogen peroxide.

There are also many sulphur colors which

are fast to light and washing, especially the new Katigen Blues, Browns and Yellows, such as Katigen Indigo C L, G G, Ex. Conc., Katigen Yellow Brown G G, L Ex., Katigen Bronze G L, and Katigen Yellow G L. In fact the relative fastness of this line of colors has been such that many mills have used them exclusively for dyeing warps which are afterwards cross dyed in acid baths, for mohair and wool goods.

The fastness of cotton colors is put to a severe test owing to the numerous washings which are given to the fabrics made of cotton. Cotton fabrics are generally washed every other week, but this is not true of the fabric made of wool. Woolen fabrics are washed less often and much more carefully than cotton fabrics. Notwithstanding the abuse that colored cotton fabrics get in the laundry, it is possible to dye colors on cottons which will last as long as the fabric itself. Amazon.

BLEACHING SILK HOSE

Editor Textile World Record:

Please give us a receipt for bleaching silk hose. Elcot (2199).

Silk hosiery is bleached with either peroxide of sodium or peroxide of hydrogen. The hydrogen peroxide is much easier to handle, although a little more expensive than the other. A cement tub having lead steam pipes is necessary. Boil the hosiery first with 8 per cent. Turkey red oil and 8 per cent. silicate of soda for 2 hours. It is also advisable to use 10 per cent. of a neutral olive oil soal. Rinse twice in warm water after boiling and enter in a boiling bleach prepared as follows. For 100 lbs. hosiery:

Add to boiling liquor
15 gals. 10 vol. Hydrogen Peroxide,
2 qts. Silicate of Soda, alkaline reaction.

The silicate must be previously dissolved in boiling water. Stir the bath thoroughly, enter goods and let stand for 2 to 4 hours. If cotton toes and heels are present they will bleach more slowly than the silk fiber. When the desired whiteness is obtained rinse twice in cold water and blue if necessary. The peroxide bath should be as concentrated as possible. Seminole.

FINISHING ARTIFICIAL SILK EMBROIDERY

Editor Textile World Record:

I enclose a sample of cotton embroidery used for dress trimming. We are making these goods with a natural silk back and an artificial silk embroidery. A fine cotton thread is also used for stitching. The natural silk back is destroyed by boiling the goods in a solution of caustic soda. This process, however, affects the color of the artificial silk. Can you give me directions for destroying the natural silk without affecting the color of the remainder of the fabric. Wentworth (2115).

This question was referred to our French correspondent who replies as follows:

The object of the process is to destroy the natural silk ground work and leave the artificial silk embroidery with its brilliancy unimpaired. The process is based on the fact that natural silk is destroyed by caustic solutions of soda and potash, while the vegetable materials remain but slightly changed. It is necessary to take into account the fact that above a certain degree of concentration caustic solutions injure cotton colors. It follows therefore that the solution must be of a minimum strength necessary for dissolving the natural silk. In cases where it is desired to leave the cotton or artificial silk embroidery perfectly white it has been found that the natural silk dissolved in the solution imparts a yellowish shade to the white cotton; to avoid this result the goods should be treated in several solutions of the alkali in order to dissolve the natural silk. The natural silk is dissolved more rapidly at a high temperature, but on the other hand, the effect on the dyed cotton is more marked as the temperature rises.

I would recommend the following process: Treat the goods in three successive baths of caustic potash at 2 1/2° Be. and a temperature of 165° to 176° F. The first caustic bath will be made a dark shade, while the other two solutions in which the goods should be left from three-quarters to one hour respectively will be tinted in a less degree. The goods should be removed from the third bath as soon as it is certain that all of the natural silk has been dissolved, particularly in the knots of the embroidery. These three baths should occupy from three to four hours. After removal from the third bath the goods should be rinsed in tepid water at 120° to 140° F. for twenty to thirty minutes, then in water at the ordinary tem-

perature until no trace of alkali remains. Care should be taken to use for the caustic solution pure water containing no lime or magnesia. These salts combined with the dissolved silk form a yellowish precipitate which it is very difficult to remove from the embroidery. As the second and third baths contain less coloring matter and dissolved silk it is a good plan to renew the baths one at a time, making the fresh bath No. 3; the old No. 3 bath taking the place of No. 2, and No. 2 bath becoming No. 1, while the old No. 1 bath is run to waste. The sample submitted is made with colored yarn, but the usual method is to manufacture the embroidery with undyed yarn and color the goods after the silk has been destroyed.

Robert Dantzer.

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DISTINGUISHING KAPOK FROM COTTON

Editor Textile World Record:

Can you give us a simple test for determining whether kapok has been mixed with a certain amount of cotton? Of late, due to the high price of kapok, manufacturers have been using comber stock mixed with kapok in order to reduce the cost of this material. We would suggest the use of some chemical which would discolor the cotton or change it in some way, but at the same time leave the kapok in its original condition. We have made some tests ourselves and find that nitric acid will turn kapok brown, but will not change the color of the cotton. However, this is the reverse of the test which we desire.

Franklin (2192).

The only direct test to distinguish cotton and kapok is by means of the microscope. The cotton fiber, as seen under this instrument, appears as a somewhat twisted, rather flat and hollow tube. The kapok fiber, on the other hand, appears as a round, smooth fiber, having in a marked degree a very distinct luster. Upon close observation, this fiber is seen to have a very thin cell-wall, and to be almost entirely free from twists. There appear, however, at times, what seem to be joints or nodules. As a rule the contents of the cells are very indistinct, differing greatly from cotton in this respect.

Chemically, there is no test that will serve to distinguish these two fibers, that can be applied and concluded rapidly, for the reason that both are nearly pure cellulose, and respond in a very similar manner to the same reagents. It is quite possible to distinguish between cotton and kapok by the use of a 1 per cent. solution of aniline sulphate (about 4 1/2 grains of aniline sulphate in one ounce of water).

If a small quantity of kapok is moistened with a few drops of this solution, it will in a short time assume a distinct yellow color, which will not appear when cotton is subjected to the same reagent. This is due to the fact that the kapok fiber contains a trace of what botanists designate as "lignified tissue," and which reacts yellow with aniline sulphate.

This test can be conveniently made in a white china butter dish. Berwick.

At different times a number of reactions for distinguishing kapok from cotton have been described, but apparently not one which will color the cotton without affecting the kapok in one degree or another. Kapok is of a more woody nature than cotton and is more easily affected by dye so that the

FIG. 1

difficulty is serious. It is possible to apply tests that will turn the kapok one color and the cotton a different color. According to Prideaux & Mitchell iodine solution and sulphuric acid turns kapok yellow or yellow-brown and turns ordinary cotton blue. Again phloroglucinol and hydrochloric acid give cotton a faint violet tone and turn kapok red-violet. Greshoff has found that zinc chloride and iodine dye cotton reddish-

blue and kapok yellow. He says that on immersing a mixed sample for one hour in an alcoholic solution of magenta (.01 part dye in 30 of alcohol and 30 of water) the cotton is hardly affected at all, but the kapok is dyed a bright red.

There is the alternative of microscopic identification. Kapok fiber consists of a single cylindrical cell of thin wall usually with a bulbous base and with a tapering stem. It is thus distinguishable from the ribbon-like cotton, Fig. 1, shown in the photomicrograph (× 120 diameters).

Wessex.

Although the chemical composition of kapok is similar to that of cotton the two can be distinguished easily by the following tests:

1. Immerse the samples for a few minutes in a chlorine solution and then squeeze out the surplus liquor. Place the sample in a saucer and pour on it a small quantity of ammonia. The cotton remains white and the kapok will become a reddish shade. In place of the chlorine solution, hypochlorite or chloride of lime can be used. The reddish shade of the kapok is characteristic, but does not remain on the fiber.

2. Immerse the fiber in nitric acid for one minute, rinse in water and immerse in ammonia. The cotton remains white and the kapok becomes yellow. Like the reddish shade with the first test, the yellow color does not remain on the kapok. Gaul.

THE FINISHING OF HAIRCLOTH

Editor Textile World Record:

I am sending a small piece of haircloth. Can you tell me how I can overcome the spots that the cloth takes from the first can on the finishing machine? Deansgate (2172).

I have not seen a piece of the haircloth "Deansgate" asked about, but I have run across the same trouble in the old country. If "Deansgate" will cut the heat out of the first two cans by clocking it at the doll head I think he can retain his usual formula for finishing and not get spots baked on the goods. The first two cans will "borrow" sufficient heat from the rest of the set to warm up the fabric gradually and prevent the baking which is due to the fabric getting the heat too suddenly and baking a crust on.

Swanset.

MARKET FOR UNION SUITS

Editor Textile World Record:

We are planning to start a small plant for manufacturing medium grade knit union suits to sell for about $7 per dozen. We are informed that there is a growing demand for an article of this kind and that it is and will be very staple. We would like to hear from you in regard to this enterprise. We might also consider making a medium grade of men's hosiery. This, however, would likely follow a little later. The underwear proposition is what we wish to investigate now. We would like to know which is the best line to take up, women's or children's. Our idea is to make one or two grades and push these through selling agents, starting with a production of 50 to 60 dozen per day. Do you consider a plant of this size, commercially managed, large enough to make the business a success?

Northumberland (2167).

We referred this question to our representative in the knit goods trade, who replies as follows:

The most promising field open in the underwear business today is in my judgment, the manufacture of men's medium grade combination suits. The manufacture of women's and children's suits seems to be fairly well taken care of, but for the past two years there has been a scarcity of men's suits to retail at $1.00 and I can see no reason why your correspondent would not be successful with an output of 50 to 60 dozen a day on this class of goods. The demand for these suits has increased very rapidly and those manufacturers who are in a position to make the merchandise have been exceedingly busy.

If "Northumberland" wishes to make two grades, I would suggest one line to weigh about 15 pounds to the dozen, to be made in ecru and silver and to sell to the jobber at about $6.50 to $7.00 per dozen. This line must necessarily be made of heavy weight carded yarn. For a second line, I would suggest one to weigh from 10 to 11 pounds at the same price and which might be made of combed yarn. This line would be better if made in ecru and peeler color and all of these goods should be made with closed crotch. Fillmore.

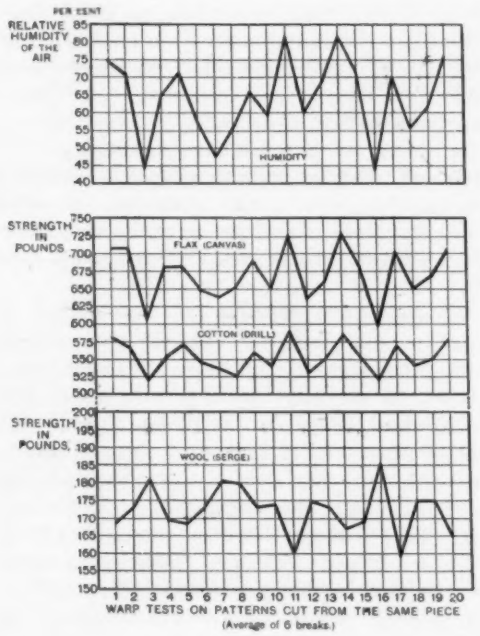
TENSILE STRENGTH OF COTTON DUCK

Editor Textile World Record:

Can you send us a standard table of weights and tensile strength for different cotton fabrics such as single, double filling ducks and numbered ducks. Our business is fireproofing and waterproofing cotton fabrics. Waterproofing adds considerable to the weight of the cloth as well as to the strength and we want some of the data above mentioned from which to base our calculations and inform our trade from time to time.

Wales (2170).

Government departments and other consumers lay down their own laws as to the strength tests that fabrics required for particular purposes shall withstand, but for obvious reasons there is no one set of standards. People in the position of the inquirer's friends usually have samples tested, before and after treatment, by competent independent experts. Conditioning houses and some textile schools perform these tests willingly and thoroughly. All results depend on the conditions under which the tests are undertaken and the tests need to be made upon one machine and on samples of equal dimensions. It is important also that the factor of relative humidity be considered.


PER CENT
RELATIVE HUMIDITY OF THE AIR
85 80 75 70 65 60 55 50 45 40
HUMIDITY
STRENGTH IN POUNDS
750 725 700 675 650 625 600 575 550 525 500
FLAX (CANVAS)
COTTON (DRILL)
STRENGTH IN POUNDS
200 195 190 185 180 175 170 165 160 155 150
WOOL (SERGE)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
WARP TESTS ON PATTERNS CUT FROM THE SAME PIECE
(Average of 6 breaks.)

The accompanying diagrams show how the strength varies in correspondence with the variation of natural humidity in the air. These are tests performed in the Manchester Testing House at twenty different times under twenty different conditions of the atmosphere. The samples were taken from the same piece and each result plotted out on the chart is the average of six breaks. In the case of the flax, canvas strips were used measuring 7 by 3 ins. between the jaws of the machine. When the relative humidity was 75 per cent. the machine registered 710 lbs. With 82 per cent. humidity the strength improved to 728-729 lbs., and at 44 per cent. fell to 613 lbs. in one series of tests and to 599 lbs. in another. The cotton drill showed best with 82 per cent. humidity, when 592 lbs. was registered and at 44 per cent. the strength was reduced to 521-523 lbs.

James Stead.

This question was referred to one of the leading manufacturers of cotton duck in this country and he replies as follows:

There is no such table in existence and we do not believe that any table showing tensile strength ever will be published. The designation of the fabric is usually an indication of the weight. A 10-ounce fabric means that 1 yard of duck weighs 10 ounces to the specified width. For example, 28 1/2 inches, 10-ounce U. S. A. duck weighs 10 ounces to the running yard 28 1/2 inches wide. The only fabric for the weight is not indicated is what is known as numbered duck. The weights per yard for this class of goods are ts follows:

No.	ozs.	No.	ozs.
0	19	7	12
1	18	8	10
2	17	9	9
3	16	10	8
4	15	11	7
5	14	12	6
6	13		

These weights are for goods 22 inches wide.

Porte.

Knitting Department

THE KNIT GOODS SITUATION

The selling season for spring, 1914, has practically closed and there are yet only a few Southern jobbers who have not placed orders on spring underwear lines. Manufacturers generally are well pleased with the business booked, although in some quarters there is dissatisfaction on account of the low prices at which a number of the lines were sold.

An advance of five cents per dozen was obtained on several of the men's 25 cent balbriggans that were in the market after July 10th, but we believe this was the only advance made along the line.

Ladies' ribbed goods were sold at last season's prices, except in a few cases where quotations of about 2 1/2 cents per dozen lower than last year's prices were named.

Notwithstanding the great increase in the demand for ladies' combination suits, buyers have placed very liberal orders on the majority of lines of straight ribbed vests.

The representatives of the "Cumfy Cut" line were out early and most buyers placed their orders for this line with the travelers on the road. Aside from this and a few other lines of branded merchandise, the orders placed at home were only in the nature of a blanket to cover the buyer until he came to the market.

The Amazon Knitting Co. of Muskegon disposed of about one-third of their production to the "Cumfy Cut" people and on the other two-thirds of their output they show a line of straight ribbed vests at about 60 to 75 cents, one of the most attractive numbers being a picot trimmed vest at 75 cents. They also make a 1x1 stitch at 72 1/2 cents which buyers have selected quite freely. This concern make a line of extra size straight ribbed vests, running from 75 cents to 90 cents and at the first price are offering a full trimmed garment which may be also had with wing sleeve.

There are in the market a number of new styles of cuts being shown in straight ribbed vests, among which might be mentioned the "Sett Well" being shown by E. M. Townsend & Co. This is a garment much like an inverted V neck, the advantage claimed for it being that the shoulder straps will stay on the shoulders without the garment showing when worn with fairly low neck gown. There is also the "E-Cut" made by E. Emmers of Royersford with buttons and buttonholes on the shoulders. It is claimed that by recoupling the shoulder straps, the vests may be changed from full bust to a V neck garment to suit the wearer. This feature is also used on a combination suit and it is claimed that by unbuttoning the shoulder straps, the garment may be opened full width which enables it to pass over the hips comfortably and then be closed to a V neck suit, if desired.

Considerable business has been placed on the various lines of 1x1 or plain stitch straight vests of which there are many being shown all the way from 75 cents up to fine mercerized and lisles at $3.50. There are those who predict that this class of fabric will take the place of the 2x2 stitches on account of the finer appearance. There are also shown many lines of straight ribbed vests made with concealed tapes or by some called band tops, and nearly every jobber has placed orders for a few lines made in this way.

There are not many lines of shaped vests and pants in the market. Some of the few that have been shown have not sold freely, buyers giving as the excuse in many instances that this is the class of goods being affected most seriously by the demand for combination suits. Of the few lines that are shown, practically no business is being done on tuck work, the calling being almost entirely for plain stitches. The prevailing price on this class of merchandise is $1.75 for high neck and from $1.50 to $1.60 for low neck with cuff pants at $1.70 and torchon trimmed

styles at $1.80 with the usual advance of 15 cents to 20 cents per dozen over the price of ordinary for extra sizes.

Plain stitch shaped lisles are being offered at $3.25 for machine finished vests and pants made with good torchon lace, and up to $3.50 for vests made with hand crochet trimming and for better quality wide lace on the pants.

An increasing demand is being felt for bodices or vests without shoulder straps and some excellent values are being shown at 95 cents for fine combed yarn goods and lisles at $1.35 to $1.75. Some of these are also made with tapes for straps to tie over the shoulders or which may be dropped inside the garment, if the wearer chooses.

The entire tendency is toward the very lightest weight goods in all lines and the consumers who demand the gauzy fabrics are apparently paying little attention to their wearing qualities.

Underwear made of woven cloth for men is in good demand, notwithstanding the frequent predictions made during the past two or three years that this class of goods must give way to the knit fabric.

It is possible now to obtain shirts and drawers made of 68 by 72 cloth, the shirts bound neck, four rows of stitching down the center plait, four pearl buttons, double stitched side seams with gussets, and the drawers with French fronts, pearl buttons, suspender tapes and reinforced crotch pieces, as low as $1.75.

The B. V. D. line is being sold at last year's prices and an improvement has been made on the suits in that they are now made with new cotton closed crotch which covers, but does not have the superfluous cloth or unnecessary trunk length.

An improvement in children's underwear recently introduced is the "Modesty Pants." These are made of knit fabrics in three qualities to retail at popular prices and are being shown by Robert C. King of New York. They have elastic bands to hold the leg part in place and are trimmed with lace and embroidery, giving the appearance of a child's muslin drawer, and the child wearing the garment may sit or play in any position without being exposed.

HOSIERY

Orders for hosiery for the Spring of 1914 have come to manufacturer's hands in good volume during the past month. Not only have buyers who were in New York placed orders freely, but travelers on the road all report excellent trade with the buyers who placed their orders at home and the majority of manufacturers expressed themselves as well pleased with the outlook, notwithstanding the tariff tinkering.

A number of lines have been withdrawn on account of being sold up and several advance prices have been noted since the opening quotations were made. Stocks are exceedingly low in all hands and the fact that many jobbers could have sold considerably more merchandize during the past three or four months, if it could have been obtained, probably explains in some measure the eagerness with which buyers have operated for the new season.

The opening prices have nearly all ruled higher than last year by a small percentage, but buyers were apparently glad to get their orders booked and very little haggling was heard in reference to prices. The fact of the matter is that, while the consuming capacity of the country is increasing very rapidly each year, there is not an equal increase in the production of hosiery taking place, and buyers have in mind a great number of orders that were undelivered during the past season.

The Senate Finance Committee has changed the figures in the proposed tariff from 40 per cent. on goods valued at 70 cents or less to 30 per cent., but domestic manufacturers are paying very little attention to this. If the bill is passed in this way, it is not believed that this change will have much effect, as there is so little to be had in German hosiery at 70 cents or under that the American trade will buy.

Reports from Chemnitz state that considerable interest is being manifested by hosiery manufacturers there over the seamless ma-

chinery that is being introduced by English makers and that some machines have been installed by manufacturers who express themselves as well pleased with their productive capacity.

Attention has been called to some extreme novelties in hosiery in the shape of curious designs of reptiles and small animals embroidered on the front of the stocking. Little marmots, squirrels and lizards are some of the animals reproduced, the eyes being supplied by means of colored stones.

Hosiery departments in the larger cities are showing lines of ornaments made of cut steel, colored glass, etc., in a great variety of designs which may be sewed onto stockings and are very attractive when worn with pumps and oxfords.

SPOTS ON KNIT GOODS

BY CYMBAL

There is no doubt but that more seconds in knitting mills result from spots than from any other cause. These spots may come from oil drops, oily parts of machinery, dirty yarn, knitting frames that are not kept clean, soiled yarn on bobbins caused by greasy hands, and last but not least, cloth soiled in the roll by handling in a careless manner. The following is written as a result of over twenty years' experience in following up these causes and remedies as a foreman of knitting and finishing and later as a superintendent in some of the largest underwear mills. This article will deal with ribbed underwear and other classes of latch needle goods.

When I first took charge of a mill in the Middle West, the first talk I had with the owner was concerning the number of seconds made. They had been getting about 8 per cent. of seconds for the past two years. We were buying the best yarn and the owner could see no reason for such a loss. So I was set to work to improve this condition. I had a man lay out several dozen seconds on the folding room table and we went over them. It was not many minutes before I had the boss knitter and finisher with me, showing and proving to them that it was up to them to stop the carelessness of their help. In nearly every case these seconds were from causes that could be prevented. Picking up a garment, a child's light weight union suit, I pointed to some irregular greasy marks on the cuff, asking the finisher if he knew how it happened. He said he didn't. Telling him to follow we went to the finishing room and on my way up I got a piece of waste cloth. Going directly to the button sewing machine, pressed the piece of cloth on the cam stop and handed it to the finisher. He compared them and said nothing. The next day there was a cover put over the end of that shaft. Covers were also placed wherever needed to keep the goods from touching oily parts of the machines.

Looking over the seconds another time, some garments gave evidence of being dragged over the floor. I found later that the boy on the turner had pushed the rolls around the dirty floor. Again we had dirty water spots and I found that these were made in the wash room, mostly by spattering water from an old-fashioned revolving tub, near where the finished rolls were laid. Many seconds were caused by the dirty waste being left around the knitting frames after they had been cleaned. This was stopped by cleaning the frames more often and blowing off the settled lint with a cardboard. Real oil spots were seldom seen. I spent two weeks looking for seconds, tracing every one that I possibly could, showing and proving how and where the damage was done. The results were surprising. We had the best of yarn and so there were few seconds from that cause. We stopped the careless handling throughout the mill, and the seconds dropped to almost nothing, in fact there was none for many days. I was with this mill for six months, but as I had a better offer further South I went there for the winter.

Some years ago I had a position as boss knitter in a New York mill, one of the largest latch needle mills in the country. I had very little trouble with the exception of oil spots on the goods. These spots were of all sizes. The superintendent spoke to me several times about them, but I had done everything in my power. The spots

came from all frames, sometimes one and again a dozen spots would appear in a roll. These frames did not roll the fabric, but they pulled out in a skein and tied up. Some frames do roll the fabric. When these rolls or skeins are cut from the frame they are generally thrown down a chute to the floor below, for the wash room or cutter as the case may be. In this particular mill the wash room was so far away that the rolls were put in a yarn case on wheels. When the case was full it was taken down on an elevator to the wash room. This cloth box, as we called it, always stood in the same place, directly under the drum and hanger boxes of the elevator. One noon I stood on the elevator and saw a black spot on the cloth in the box. Looking at the shaft boxes, I thought I had solved the problem, but the boxes were dry. Nevertheless I was sure this was the cause of the difficulty. After dinner I told the superintendent about it. We examined the elevator carefully, boxes, shaft and drum, but all looked dry and clean. The superintendent laughed and went away. I sat near by for hours watching for another drop. That night I pushed the cloth box from under the elevator and put some clean white paper there, but the paper was clean and white in the morning. I decided to let it stay there a day and went away on other business. During the day I examined the paper frequently, paying no attention to the grins of the knitters who watched the experiment. Along towards closing time a boy told me there was a black blot on the paper and sure enough there was a good sized, dirty oil spot. It stayed there until morning and it had grown during the night. Looking directly over the spot I could see nothing and fearing a joke had been played I sat in a chair near by for hours watching for another drop. Finally I was rewarded by seeing a drop come down. Jumping to my feet I got a ladder and examined everything carefully, but without avail. I remembered that when the drop came someone had started the elevator. I got a boy to start and stop the elevator while I watched the ladder. There it came, again and again as the boy started and stopped the elevator. Simple, yes, it all came from the end of the worm gear shaft. This shaft runs in a bath of oil. Both collars being loose they slapped against the end boxes when the elevator was started or stopped, throwing a spatter of oil through the square opening near the end of the shaft. This incident goes to show the difficulty in getting at the bottom of a troublesome problem.

On some styles of latch needle frames where the cloth take-up revolves, there is a rocker that rides up and down a series of cams on the lower plate. This gives a motion to the rollers and regulates the tension of the cloth. After a few drops of oil has been put on these cams the rocker will generally hit the cam hard enough to spatter oil onto the cam or roll, whichever the frame is equipped with. This has caused a great deal of trouble to knitters. I have a case in mind where a knitter, and a good one, lost his job because he used an oil can instead of an oil soaked rag, to oil these cams. He had perhaps forty frames of this style and many complaints were received on account of oil specked cloth. He was making a ladies' cheap shaped vest in white cotton and every speck showed up clear after the bleach. He did everything he could think of to trace the spots, but had not hit on the right thing. He got tired of the continued complaints and quit. Another man took his place, but the spots still continued. One day there came to the mill an agent for these machines and he was told of the trouble. He at once told the knitter to keep oil away from the take-up cams and he gave an example by rubbing the cams with an oil soaked rag. This solved the problem, after hundreds of dollars had been lost.

I know of a mill that was built close to a railroad yard. Smoke, soot and even hot cinders cost the owner over half his profits in damaged goods before he changed the location of the plant. Another case was a mill on the fifth, sixth and seventh floors of an old business block. This factory was scattered all over the top floors, many other firms having rooms between. The knitting room was on the top floor, winding room on the second floor below, connected by elevators and the finishing rooms were widely

separated. The result was dirt and dust everywhere. This firm had given up hopes of getting less than 10 per cent. of seconds until they built a new mill, when their percentage of seconds dropped to about 2 per cent.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

TROUBLES IN A KNITTING MILL

BY F. W. HETHERINGTON

In the September, 1912, issue, I gave some of my experiences at the mill, including an incident in connection with the steam pipes of the mill. Another incident occurred in the following winter when the weather was the coldest and this turned out to be an even more serious incident than the one with the steam pipes. The small turbine water wheel was in the bottom of an "L" shaped box or flume, as it is called. This flume was about 24 feet high and 2 feet square. The 20-inch turbine was placed at the bottom so that the full weight of water 20 or 22 feet high in the flume was on the wheel. The amount of power depended on the height of the water.

Figs. 1 and 2 show the water wheel, flume and pipe entering the flume. A is the L-shaped flume; B is the water wheel in the bottom of flume; C, the section of wooden pipe running from pond into the flume; D, outlet of water from flume through the water wheel, B; E and F, bevel gears connected to shaft, G; H and I, two more bevel gears connected to shaft, J, which passed through the mill wall, K. On the end of the shaft, J, inside the mill was a wheel, M, which enabled the gates of the wheel to be opened or closed inside the mill building, N being the floor level.

There was a vertical shaft connected by bevel gears to a small horizontal shaft and worm gear, which opened up all the small gates of the wheel. On the other end of the shaft were two more bevel gears, one attached to another short shaft entering through the wall of the mill. Inside on the first floor a hand wheel was attached, so that the gates of the water wheel could be opened and the power started from inside the mill. One morning the man who started the power found that while the shafts turned freely, the gates of the wheel did not appear to open, as the shafting which drove the machinery revolved very slowly. We tried

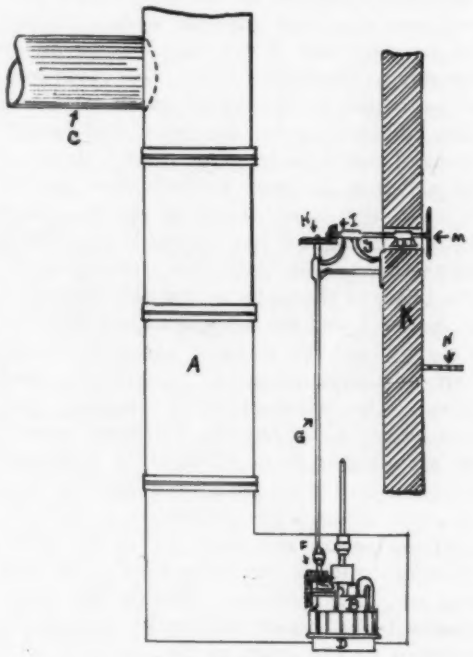


FIG. 1

shutting the gate down, and then opening it again, when it was finally decided that one of the bevel gears near the wheel had become loose on the shaft. As we could not open the gates to get power, the mill had to shut down. To make matters worse, power was necessary to run the pump to force water into the boiler, so we had also to go without any heat in the mill.

The break did not appear to be a very difficult one to repair, we all thought. All that would be necessary would be to shut off the water in the pond at the mouth of the wooden pipes running through the dam and connected with the flume. The gates of the wheel being slightly open, the water in the

flume would soon run out, and we could then take off the boards from the top of the "L" part, and refasten the gear to the shaft. The first thing was to put down the gate in the pond and thus close the mouth of the wooden pipes, when we fully expected the water would soon run out of the flume and leave it empty. After waiting some time, we found that the water was coming into the flume as fast as it was going through

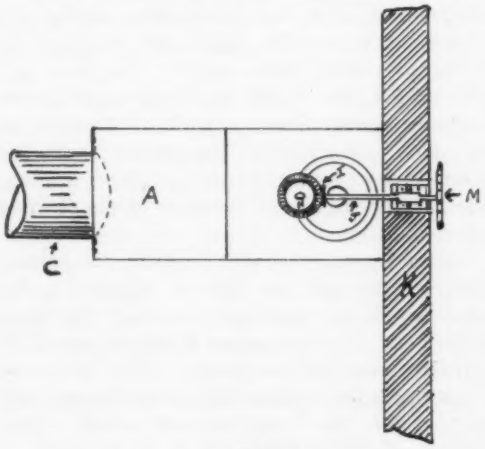
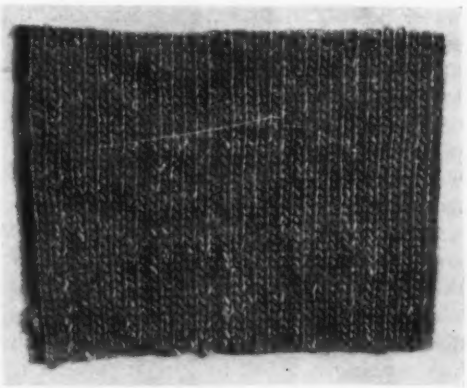


FIG 2

the wheel at the bottom. We were at a loss to account for this, as upon looking at the gate again, it appeared to be closing the mouth of the pipe all right. We then thought it possible that there might be some leaks between the gate and the pipe, as the gates of the wheel were open only a little. We dumped several loads of bagging, manure and sawdust in front of the gate to stop whatever leaks there might be. Still the water came into the flume as fast as before.

We were then in a quandary as to what to do next. We concluded, however, that the leaks were greater than the openings of the gates of the wheel. We found it impossible to open them any wider, as the continual working of gears back and forth had resulted in making the gear on the shaft looser, so it would not operate the gates at all. We decided to make an opening about 8 inches square in the flume near the top of the "L" or directly above the wheel. This was not an easy thing to do, with the weight of 20 feet of water against any opening that might be made. We bored 2-inch holes all around the proposed opening until they were nearly through. When this was done the question was how to knock out the piece. As there was a heavy weight of water inside and it would require quite a heavy blow to knock it out, it was not safe to be too close to the opening when it was broken, as the

FIG. 3



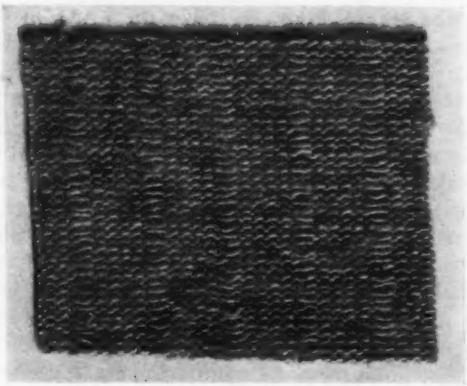


FIG. 4

water would knock down and injure any man who might get in the way. We obtained a long pole which was used as a battering ram. With four men at a safe distance we succeeded after a good many blows in knocking out the piece. The water rushed out and the spray enveloped us all. The

weather being extremely cold, it froze immediately and hung in icicles on our clothing.

We all went home to get our clothing thawed out, fully expecting that in a very short time the flume would be empty so we could get to the water wheel and fasten the gear to the shaft again. On our return in about an hour we found the water had gone down only a few feet. As it was then below the bottom of the wooden pipe, we could see the quantity of water which was still flowing in from the pipe. It was about one-quarter of the diameter. There was still so much water flowing in that we were unable to get to the wheel. We concluded that the leaks at the gate were the cause of this, so the next thing to be done was to open the gates of the waste weir, and allow the water in the pond to run out until it was below the wooden pipe. This was a very risky thing to do in the winter time, as an old wheelwright said the frost would get into the dam and cause it to break away. The owner of the mill was away at the time, so the responsibility was left on me. After considerable discussion I decided to take the risk, as there was nothing else left to do. It was then the middle of February and we could not wait till spring came to get it fixed. It would take several hours to lower the water in the pond and after we got it fixed it would take at least two days for the water to fill up so as to flow into the flume. After the water had been lowered sufficiently, we succeeded in emptying the flume and then proceeded to take off the planks on top of the "L" and get to the wheel. We found that the gear had originally been fastened to the shaft with two sets screws and also a pin through the hub of the gear and the shaft. The pin was cut off at the shaft, and the two set screws were not sufficient to hold it. We put in a new pin and also counter sunk the shaft where the set screws were, so as to make it secure as possible and prevent a reoccurrence of the break.

The next difficulty was with the planks that had been taken from the top of the "L" as these were covered with ice from the spray from the opening made in the flume. We had no stoves in the mill, and we were unable to get up steam in the boiler, as we had no way of getting water into the boiler except by a pump run by power. We soaked cotton waste in kerosene oil and set fire to it to thaw the ice from the planks. This thawing out was a slow job, but we finally accomplished it, replaced the top and then there was nothing more to be done until the water raised in the pond again. We had to wait two days so that altogether the mill was shut down for nearly a week.

In the spring after the ice broke up, we discovered why we could not empty the flume. We found a small hole in the dam close to the wooden pipes. The first and second lengths of pipe had come apart, leaving an opening about 1/3 of the diameter of the pipe. We had to shut down again for four days to repair this, after which nothing further occurred of interest while I was there.

After leaving the mill in 1882 the parties who had bought the patent rights for the new stocking machine for the Maritime Provinces failed to make their payments as agreed upon and the patent rights reverted to the original owners. It became necessary to exhibit the machine and resell these rights. I was reemployed to do this and in about six weeks' time the patent rights were resold. While I was engaged in this work a man became interested in the manufacture of stockings and decided to start a small factory, putting in ten knitting machines for ladies' hosiery. He also installed one spring needle knitting machine for the manufacture of men's underwear, and hired me to work for him. Figs. 3 and 4 show a sample of the striped goods we made. The same goods had recently been made in the United States, but not in Canada. It was a combination of plated work with a vertical stripe, made of wool and cotton yarns of nearly equal sizes. The garments were wool dyed in scarlet and olive brown. The cotton not taking the dye, this process produced a garment showing a vertical stripe of solid color, and between the stripes a mottled effect of scarlet and white.

The vertical stripe was produced in the United States by a sinker burr, which contained blocks in the interstices, every fourth, sixth and seventh space, according to the

width of stripe desired. As the fabric was plated work composed of two threads, one cotton and one wool, two sinker burrs were necessary, the blocks in the sinker burr feeding the cotton thread closed the beards of those needles, so that only the wool thread was fed to them, thus producing the solid vertical stripe. I made the same thing by using spring needles, the beards of which were about 3/32 of an inch longer than the other. Instead of using the blocked sinker burr, which was better, because the blocks in the sinker burr in addition to the closing of the beard of the needle also pressed the needle back out of line with the others, which necessitated constant plyering of the needles to keep them true to the circle. A long bearded needle was cast in the lead with a short bearded one, and those placed in the cylinder to suit the width of stripe wanted. The sinker burr feeding the cotton was set high enough so that the yarn was not fed to the long bearded needles, but crossed it on the outside.

SIZES OF BALBRIGGAN UNION SUITS

Editor Textile World Record:

Please give us the latest scale of sizes for men's flat balbriggan union suits.

Wilton (2215).

I enclose the correct measurements for men's flat balbriggan combination suits. It will be noticed that I have given the scale of lengths for the three-quarter length suit, as I find that during the present season a very large proportion of the business has been done on this length garment, the end of the cuffs of which is supposed to reach to the bottom of the cuff of the sock. I have also given measurements for short sleeves and the same applies to the top of the sleeve.

Sizes	Chest	Shoulder to Crotch	Inseam for Ankle Length	Inseam for ¾ Length	Long Sleeves	Short Sleeves
34	17	30	26	21	17	8
36	18	31	27	22	18	8
38	19	32	28	23	19	8
40	20	33	29	24	20	9
42	21	34	29	24	21	9
44	22	34½	30	25	21	9
46	23	35	30	25	21	10
48	24	35½	30	25	22	10
50	25	36	30	25	22	10

As "Wilton" will undoubtedly put in a set-in sleeve in his garment, the bottom will measure some two inches less or as much less as the sleeve is set in at the top. Filmore.

AN ATTACHMENT FOR KNITTING MACHINES

An improved method of producing designs on plated knit fabrics has recently been patented in this country. The machine, which is shown at Fig. 1, is full automatic. One object of the invention is to provide simply constructed mechanism for producing various designs of knit fabric and which may be

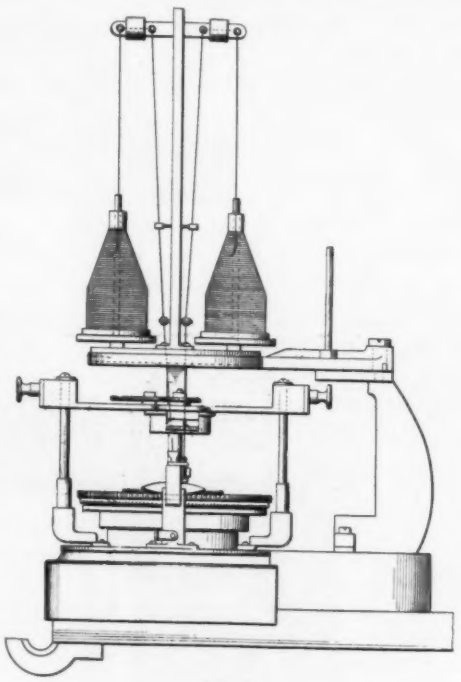


FIG 1

applied to any circular knitting machine already in use. Another object is the provision of a simple mechanism for producing various designs of knit fabric composed of regular meshes interspersed with enlarged or stretched stitches arranged regularly or irregularly to form a pattern. Means are provided for moving certain needles laterally at predetermined intervals for the purpose of stretching certain stitches to enlarge them and produce open work according to the desired pattern. The stitch stretching devices are controlled by the operator to form the stretched stitches in alignment, alternately, zigzag, or in any other desired form. These enlarged stitches are formed

from a different thread from that used in the other exposed stitches which form the exterior of the fabric, rendering the openings formed by said stretched stitches more noticeable.

Fig. 3 is a horizontal section of the machine. Fig. 4 shows the housing and cam groove in which the needle jacks are mounted. Fig. 6 shows the position of the needles and the threads. Fig. 7 is an illustration of the fabric made by the improved attachment.

The attachment, mounted on the cam cylinder gear comprises three posts, which are fixed to the gear at suitable points and project upwardly any desired distance, the posts being equipped with caps and having longitudinally spaced sockets in their outer faces. A plate is mounted on the uprights. The arms of the plates are provided with openings for the passage of the posts. Spring pressed catches having operating heads project into the apertures and are designed to engage the sockets in the posts to lock the plate in the desired position. The posts have shoulders arranged to support the weight of the plate and its attachment, and to limit the downward movement of the plate.

One side of the plate has a lateral extention from the lower face of which depends a cylidrical casing. This hood is open at one side and projects into the upper end of the needle cylinder adjacent to the inner faces of the needles at a point opposite a thread carrier, the open side of the casing or hood being arranged adjacent the needles, as is shown clearly in Figs. 2 and 3. Arranged within this casing is a cylindrical casting fixed to the plate and having a central bore with an upwardly projecting sleeve extending through an opening in the plate. This casting has a cam groove in its lower face which registers with radically extending seats formed in a rotary member. Any desired number of these seats may be employed and are designed to receive needle actuating jacks. These jacks are constructed as shown in Fig. 5, each having a vertical groove in the front end for engaging a needle and having a lug or finger extending from the upper edge. These lugs are designed to fit in the cam groove of the casting. When the jacks

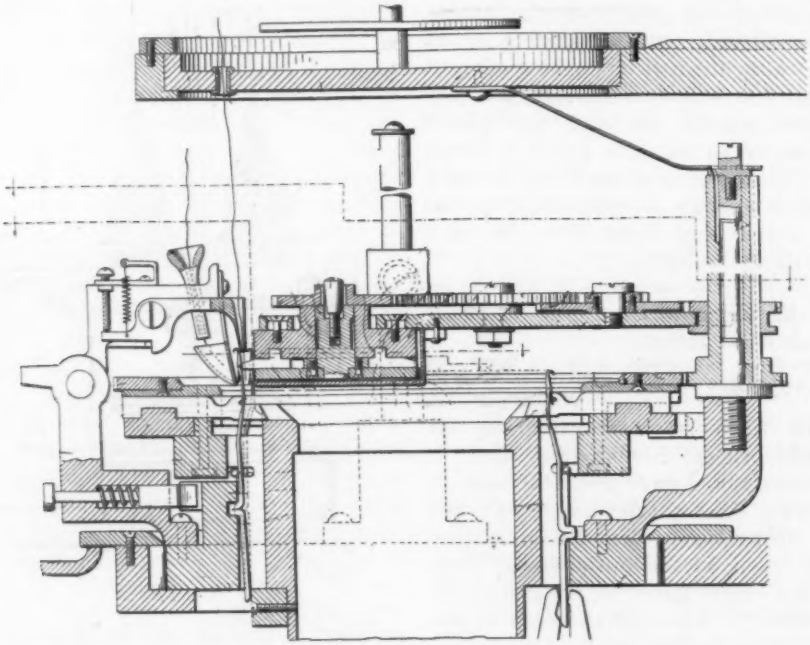


FIG. 2

reach a certain portion of the cam groove they are moved out by the eccentric formation of the groove to cause the free ends of the jacks which are projected to engage and

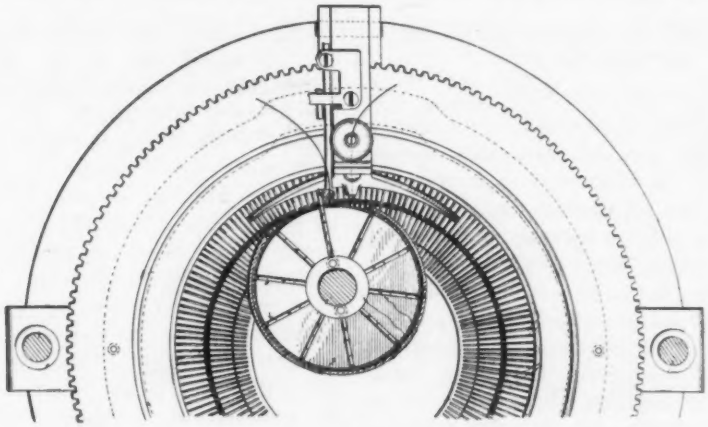


FIG. 3

bear against the rear face or edge of the needle opposite, and force the hooked end of the needle laterally outward against the tension of the spring needle retaining band. The needle is moved out of the path of a

FIG. 4

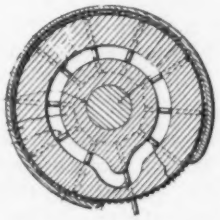
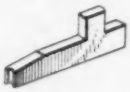


FIG. 5



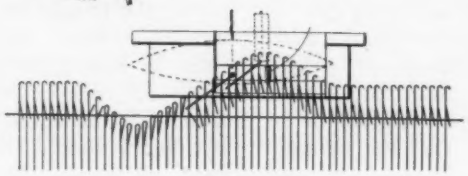


FIG. 6

thread, W, fed from a suitably disposed thread guide, as shown in Fig. 2, to permit the thread to pass behind the needle so actuated and thus escape engagement with it. The laterally deflected or projected needle so engaged by the jack thus misses the thread, W, which passes behind it and forms a floating thread or loop, as indicated at Fig. 7.

Two threads, B and W, of different colors, are shown and both are engaged during the knitting process by all of the needles except those which are projected by the jacks at predetermined intervals. One thread forms the outer face of the fabric and the other the inner face, as is shown clearly in Fig. 7,

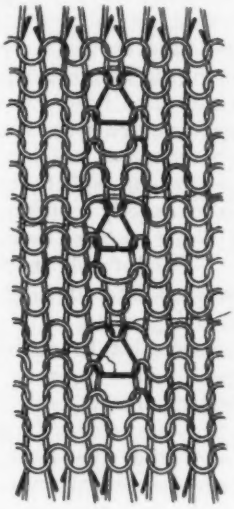


FIG. 7

the white thread being here shown outside and the black thread on the inside.

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It is estimated that the active cotton consuming spindles of the world for the year ending August 31, 1912, was 140,996,000.

Dyeing, Bleaching, Finishing, Etc.

DYEING AND WATERPROOFING OF COTTON DUCK

BY DR. LOUIS J. MATOS

The dyeing of cotton duck or of cotton fabrics of weights heavier than eight ounces, that require to be ultimately waterproofed, demands the use of dyeing machines that will give an output considerably in excess of the ordinary jigger. As a general rule, most cotton fabrics that are to be dyed and proofed are for certain out-door uses, either as tarpaulins, boat covers, tents, portable houses and consequently the dyes used. The process of applying them must be of the utmost simplicity, and the color must be fast to light and weather. Dyeing simplicity means the maximum of penetration and fullness of shade with the least complication of the dye bath. Of course, almost any shade may be produced by the dyer, but with very few exceptions the demand for such goods is limited to khakis and browns with the greatest demand existing for browns of greater or less fullness.

For browns of the greatest depth and fastness, and at the same time, extreme cheapness, the dyer has cutch always at command, and for which there has not been produced an entirely successful substitute, although the shade can be exactly matched with many sulphur and direct colors, especially when aftertreated. Cutch-dyed cotton, when thoroughly washed after dyeing, is particularly durable, independent of its shade, and is not very susceptible to mildew, as it is never "dressed". As a general rule, ducks and similar fabrics are not boiled out before dyeing, but are run direct from the bale directly through the dye bath, and then through a heavy squeeze, afterwards through the chrome bath, then squeezed, and finally run through a wash, squeezed and dried. If the goods are to be proofed with aqueous waterproofing solutions, the drying is omitted, but if the waterproofing is to be effected with paraffin wax, stearic acid, or paraffin-rubber mixtures, the goods should be absolutely dry—i. e., "bone dry"—in order that the waterproofing mixture should have every opportunity to penetrate the goods, which would not occur if the cloth is even only slightly damp.

Where absolute penetration is demanded, as is the case where the dyed and proofed goods are consumed by makers of high class camping outfits, motor boat covers, etc., the dyer must dye on the jig, giving as many passages as may be necessary, or make use of the continuous dyeing machine, which gives the yield, while it may not always give the penetration. In dyeing the usual heavy cutch brown shade, it is found most convenient to make up a stock tank of mat cutch, dissolving the cutch in boiling water, then straining to remove pieces of the matting in which the cutch is generally wrapped, and also the occasional stones found in them. The cutch stock liquor is reduced to a certain working gravity and then drawn off as required, into the dyeing machine. The bichrome solution is made up to a fixed gravity and also kept in a stock tank. If the dyeing is done in a continuous machine, the dye compartment is provided with several top and bottom rollers, usually larger in diameter than is provided for similar machines adapted for light weight fabrics, and speeded so as to give a slow passage of the duck through the dye liquor; the longer the immersion the better the penetration. The bath should be kept constantly boiling with a closed coil, and the supply of stock cutch liquor should be in unison with the speed, so that the take-up of dye liquor should be the same for every yard of goods put through.

From the cutch compartment, the cloth is given a good heavy nip, and run at once into the boiling chrome to fix the color. If the plant is equipped with a separate wash room, the very highest results are obtained, but if the washing must be done immediately, the

compartment should have ample size, and an ample supply of water.

The dye liquor is prepared with 25 to 30 pounds of cutch extract and 2 to 3 pounds of blue stone for each 100 pounds of duck to be dyed. Then chrome in a bath containing 2 1/2 pounds of bichromate and 2 1/2 pounds of bluestone for each 100 pounds of goods. It is a matter of some difficulty to determine without any preliminary trials, exactly the quantities of either cutch, chrome and bluestone to be used, as the qualities and color values of cutch vary considerably. It is also difficult to advise whether additions of logwood are necessary in order to give body to the desired shade. Some cutch browns are produced with the aid of small quantities of either logwood or fustic.

Afterchromed immedial colors are much used for many grades of cotton ducks both for tentage cloths, sportsmen's waterproof garments, etc., giving shades that are pleasing in appearance, besides leaving the cloth as soft and pliable as the undyed fabric, a condition not possible when it has been dyed with cutch. Owing to the great extension in the use of this group of colors for cotton fabrics formerly dyed with natural cutch, but which did not have the familiar handle characteristic of the latter dyestuff, it becomes necessary in order to meet this particular demand, to devise a process that would give the desired "handle". This is accomplished by passing the goods dyed with the immedial browns or immedial cutch through a bath containing from 3 to 5 per cent. of alum calculated upon the weight of the duck, then drying without washing. If the dyeings are aftertreated with bichrome and bluestone, the alum is added to the aftertreating bath with the other chemicals and dried without washing.

While there are many processes for waterproofing heavily woven cotton goods, the bulk of this class of work is treated according to two general processes, viz., alum and soap or alum and sugar of lead with their several modifications, and treatment with benzine solutions of paraffin or paraffin in combination with either rubber or one of the solid fatty acids.

The so-called alum process is very old, and is of the first importance. The several formulas given below are entirely trustworthy and are from actual practice.

A large cask or tank is fitted with a steam pipe and a suitable draw-off cock. Fill with 100 gallons of water, and add 25 pounds of clear brown glue. Allow to soak over night, gradually heating up in the morning, and stirring until dissolved, then add 25 pounds of white tallow soap in pieces, stirring until dissolved, and finally add 30 pounds of alum, and continue boiling until a uniform solution is obtained. This is used at a temperature of 125° F., the goods being passed through slowly once, squeezed and dried, and at once passed through a second bath made up with 95 gallons water, to which are added 5 gallons of acetate of alumina, made by dissolving 6 ounces of alum and 6 ounces of sugar of lead, mixing and allowing to settle before the clear solution is added to the 95 gallons of water. Afterwards the goods are squeezed and dried.

Another method which does not require any intermediate drying is to pass the dyed cloth through a bath of acetate of alumina standing at 9° Tw. and heated to 100° F., and then immediately through a second bath made up with 80 pounds of hard white soap dissolved in 100 gallons of water, at 100° F., when the goods are squeezed and dried. The object of this kind of waterproofing is to cause to be deposited on the cloth, a precipitate of oleate or stearate of alumina which possesses a high resistance to water.

The use of volatile solvents in waterproofing is limited to the cheapest petroleum distillates, viz., gasoline or benzine. Such fluids permit the use of waterproofing agents, that are quite impossible to apply from any other liquid and consist of paraffin, stearine, rubber, etc. It is best to proceed by melting a quantity of paraffin wax in an iron kettle and when quite hot, but not near the "smoking" temperature. Stir in an equal weight of pure rubber, adding it only as rapidly as it dissolves in the molten paraffin. When all has been added, allow the mass to become cold, first pouring it out into pans. This "alloy" of wax and rubber

dissolves quite easily in benzine in the cold if previously cut up into small pieces. The strength of the proofing solution need not be greater than two ounces of the wax mixture per gallon of benzine. The goods to be "proofed" must be absolutely dry, but not hot, in order to ensure thorough saturation. One passage is sufficient.

The drying of heavy cotton fabrics is a matter of some difficulty and can only be successfully accomplished in a specially constructed loft or drying chamber, to which an ample supply of hot, dry air is admitted, and provided with exhaust fans to remove the saturated vapors. Two general methods are in common use: one where the goods travel through the chamber, hanging in long folds from overhead poles, in the opposite direction to the course of the heated air current. The other way is to stretch the cloth on a tenter frame, the heat radiating from horizontal coils of pipes arranged under the cloth. This appliance keeps the selvages straight and the cloth ready for the calenders.

There are many other proofing processes in use, but upon comparing the cost of the several mixtures, it will be found that those above described produce a degree of resistance to water that cannot be excelled by the use of compositions of greater cost. Of course the processes given are not to be compared with the strict rubber processes, where melted rubber is spread by means of heated rollers over the goods.

It is surprising how small a quantity of waterproofing ingredients is necessary to produce a perfect piece of goods. It is an error to believe that strong solutions are necessary to effect thorough treatment. The main point is to aim for saturation of the cloth rather than a wetting of the surfaces. Slow passages of the cloth through weak solutions are more advantageous than rapid passages through relatively stronger solutions.

The exports of cotton cloth from the United States and the United Kingdom to China during 1911 are $7,657,334 and $48,022,144 respectively, as compared with $4,151,340 and $35,384,194 respectively, in 1910.

A YARN DYEING, BLEACHING AND MERCERIZING PLANT

From Uhlands Technische Rundschau.
Translated from the German by the Editor of the Textile World Record.

Figs. 1 to 6 show the construction and arrangement of the dyeing, bleaching and mercerizing plant built by Albert Jaeger in Teute, near Barmen, Germany. This establishment is located where it can obtain an ample supply of soft water free from iron, which is essential for the successful dyeing, bleaching and mercerizing of textiles. The water supply is obtained from a well, p, 6 feet 6 inches in diameter and 23 feet deep, located in the court, E. The water is pumped through the pipe, 4, by a centrifugal pump in the boiler house, A, and flows into a tank, A1, having a capacity of 900 cubic feet, and which is located in a tower 52 feet high. From this tank the water is carried in pipes to the different rooms in the mill. A second pump, e, in the machine shop, A2, draws the water from the well for feeding the boilers. The rain water is carried from the roof to a tank from which it is drawn to supply the boilers when required.

The building is built along the edge of the Schwarzbach, which necessitates the irregular form shown at Fig. 5. The rooms, J, J1 and J2 are used for drying the material, E2, for bleaching; E1, for dyeing; B, mercerizing; B2, color room; B1, felting room; D, office; A2, machine shop; A, boiler house; K, coal shed; F, wagon house; F1, stable; F2, harness room; G, open air drying loft; G1, chloride of lime room.

The boiler house is planned for two Cornwall boilers; only one, having a heating surface of 540 square feet, is installed. The boiler is provided with a steam dome to meet the variable demands for steam. The chimney, located near the storage battery room, A3, is 95 feet high and with an interior diameter at the top of 3 feet. The power house, A2, contains a horizontal single cylinder steam engine, which runs at a speed of 135 strokes per minute. The dye house, E, the bleach room, E2, the mercerizing room, B, and the dry room, I, I1 and I2, are lighted with arc lamps; the other rooms with incandescent lamps.

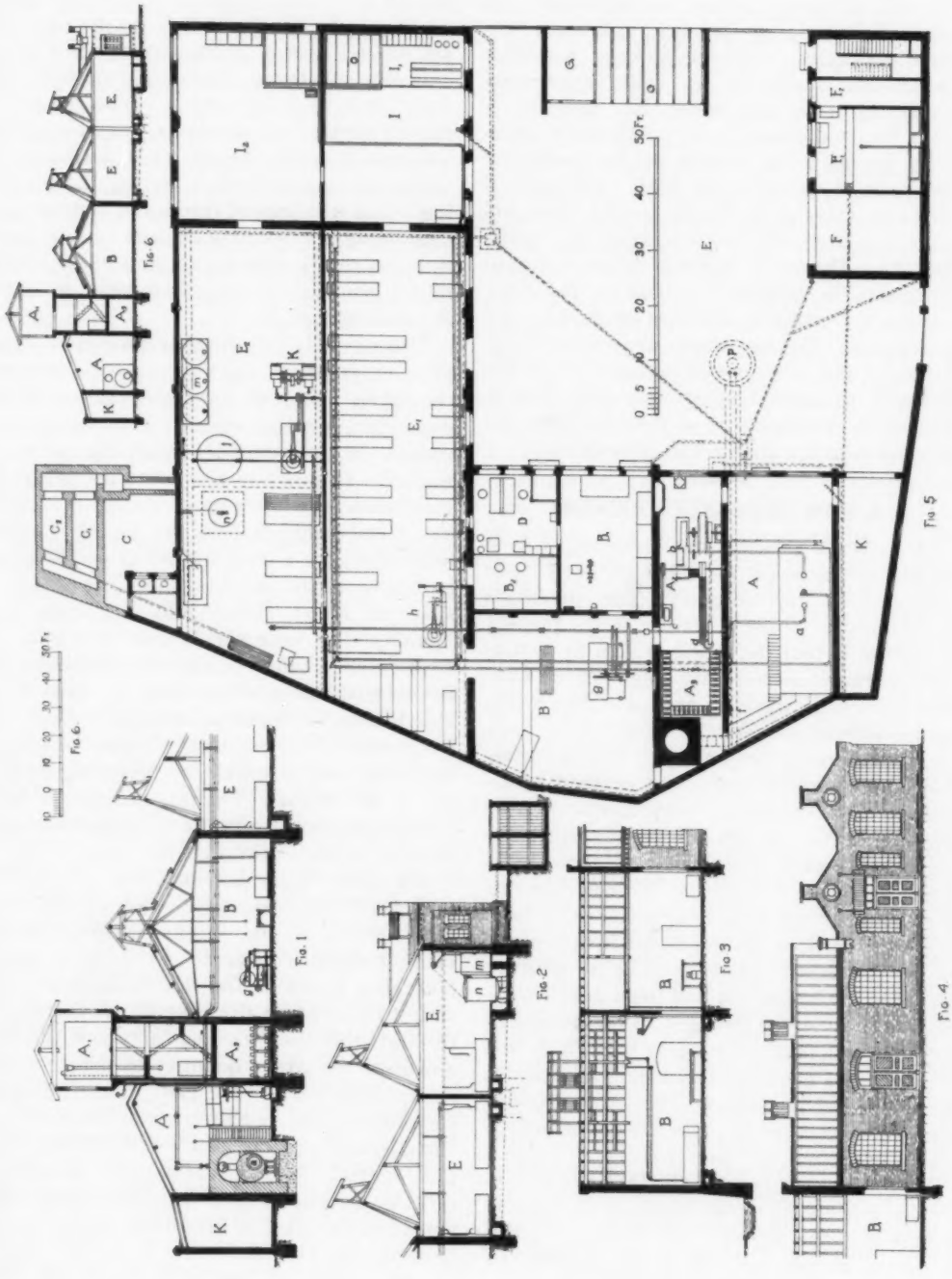
Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
Fig. 6

The electricity is generated by a dynamo located in the room A2. In addition to the main lighting plant there is a lighting system connected with the storage batteries, which are located at A3. The vapor accumulating in the dye house, E1, and bleachery, E2, is allowed to escape through openings in the roof, which can be closed by swinging doors when desired. The yarn is dried in trays each having a daily capacity of 170 pounds, the results being very satisfactory. The waste liquor from the different processes is carried by pipes to the filter rooms, C1 and C2, where it is purified for use again. The two filters are entirely separate so that one can be cleaned while the other is in use. The ground plan, Fig. 5, shows the arrangement of the machines and apparatus in the different departments.

A NEW BLEACHING PROCESS

A German process for bleaching cotton goods in the rope form has recently been patented in this country. The inventors state that the essential feature of the present invention is that the fabric is kept in continuous forward motion and subjected to alkaline bleaching, washing and acid treatments in immediate succession. Heretofore, they state, such processes have not been successful, either because it was not deemed advisable to depart from the old principle of storing the fabric in a suitable vessel after passing it through the bleaching solution, leaving it for some time in the storage vessel to the action of the bleaching solution, it having hitherto been assumed that if this is not done, the fabric would not be sufficiently bleached, or because it had been deemed advisable to raise the strength of the bleaching solution and then thoroughly wash it in hot water before treating it with acid to neutralize the bleaching action. The latter process, however, damages the fabric without appreciably improving the bleaching.

By the present process the fabric is moved slowly, but continuously, through the vessels containing the liquids for treatment, the goods requiring from 10 to 25 minutes to pass through the alkaline and acid bleaching vessels. The cloth is first subjected to the action of a warm alkaline bleaching liquid, such as hypochlorite of lime, in the first vessel, which decomposes the greater part of the coloring substances remaining in the fabric from the scouring tank. The fabric is moved slowly and continuously through the alkaline bleaching liquid for a period of 10 to 25 minutes and upon leaving the bleaching liquid it is passed through a rinsing tank containing a weak hypochlorite of lime solution, so that a definite amount of bleaching liquid remains on the fabric after it leaves the rinsing tank.

The cloth is immediately passed through another vessel containing an acid solution, the fabric being moved slowly and continuously through this vessel for 10 to 25 minutes. Upon leaving the acid, the fabric is washed. In order to accelerate the action of the liquids, the latter may be slightly heated, but it is essential that the liquids be not heated to such a temperature as would cause partial or entire decomposition. It is impossible to inject steam into the bleaching liquids or to heat the liquids by means of steam-heated tubes as has been proposed. It is essential that heating tubes or other suitable heating surfaces be employed which are not heated to an essentially higher temperature than that to which the bleaching liquids are to be raised. For this purpose a fluid such as warm water of the requisite temperature is circulated through the tubes.

The fabric is not left for some time to the action of the bleaching liquid in the first tank nor is it thoroughly washed before being treated with acid. By using a warm bleaching liquid in the first tank it is possible to accelerate the passage of the fabric through this tank and to carry out the removal of the larger quantity of the coloring matters to such an extent that the acid bleaching action can be effected when only a small quantity of the alkaline bleaching solution remains in the fabric. The bleaching process is thus divided into two steps, the first step, the alkaline bleaching, being intentionally not carried out to the extent hitherto usual, so that only those coloring

matters are removed which are easily capable of being oxidized without danger. It has the advantage that the alkaline bleaching is not carried so far as to run the risk of the formation of oxycellulose.

On the other hand, little bleaching remains to be done by the acid which in itself is dangerous to the fabric so that very weak acid solutions may be used and the fabric only subjected for a short time thereto. Not only are those substances removed which are only capable of being decomposed by the acid, but also the rest of those substances which are capable of being decomposed by the alkaline solution but which would require such intensive action on the part of the solution that oxycellulose would be formed. The improved process results in a saving of time and enables a pure and durable white to be obtained.

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DYEING AND FINISHING WOOL GOODS

BY F. SADLER

From Dyer and Calico Printer

With woolens scouring as a rule follows milling, and has for its object the thorough cleansing out of the milling soap and whatever impurities there are in the cloth. Occasionally, for some special finishes, scouring is done before milling, and with some cloths the two operations of milling and scouring are effected simultaneously in one machine. However it is done, it affects the subsequent dyeing in a marked degree, so much that a saying in the trade is—a thoroughly scoured piece cannot be dyed uneven, which is a truism providing ordinary care is given to the dyeing.

Washing after dyeing hardly comes under the head of scouring, although such detergents as fullers' earth and ammonia are often used. This rinsing is always given after dyeing with indigo or the dyewoods, in order to clear away the loose dye which adheres to the outer parts of the threads. Rinsing in cold water is also necessary after speck or burl dyeing, as it also is after carbonizing to remove the acid, but in the present instance scouring is referred to as the first cleansing of the fabric after leaving the loom.

The operation of scouring milled cloth may be divided into two stages, first the solution and loosening of the dirt, grease, and size, and, secondly, the rinsing of this away with warm or cold water. When the two stages are combined in a machine which both mills and scours the cloth, an advantage is claimed that the dirt leaves the fabric much easier while it is still warm from the friction of milling, whereas if transferred to the washing machine the cloth has time to cool down and the thorough cleansing of the fabric is prolonged. However, it is a well acknowledged fact that after milling the goods are best scoured at once, without any laying about between the two operations, and this is particularly the case in warm weather.

When a suitable soap has been used in the milling, and has retained its vitality to the end of the process, there is then no question that the scouring process will be an easy one; in fact, simply a mere rinsing is necessary if the wash water is used lukewarm. When, however, the soap used for milling has lost its vitality before the process is finished, or just at this point the soap is of too light a body, then a scouring soap or liquor has to be used in the washing to get the goods clean.

The body of these should not be heavy; in fact it is always better to keep them light, say about 12 ounces of soap per gallon (10 lbs.) of water, that is, the liquor in the body of the machine. Cheaper grades of soap may also be used for the scouring of woolens, as the strength of the liquor is what is required, so that a larger amount of alkali is necessary than a milling soap requires. Of course, when scouring goods which have been yarn dyed the strength of the liquor requires careful watching, otherwise the colors will bleed, and to prevent this common salt is sometimes added to the scouring liquor. This addition does little good beyond rending the soap less soluble, and a far better addition to a soap liquor which is suspected of possessing caustic properties is a small quantity of sal-ammoniac. Where caustic alkali is present this reacts and changes the soda to common salt, at the same time liberating free ammonia which is

a much less drastic detergent than the soda.

Soap and alkali should be always boiled up in tubs by means of a steam pipe, and added to the clean water in the washing machine, adding the soap gradually until a permanent lather makes its appearance. After this, the goods will want running about twenty minutes, then wash out with several lots of lukewarm water followed by a cold rinse. A good scouring liquor is made up by dissolving about two ounces of pearlash to the gallon of water, but for low goods this is more often replaced by soda ash which is cheaper and much more caustic.

Warm water may be used for scouring woolens, but not any hotter than the hand can bear comfortably, while for worsted it must be nothing more than lukewarm, or the goods will crimp. After the washer is started, the warm water is run in until the trough is about half full, having previously closed all the gates, and the goods are run in this water for about ten minutes. There should then be ample evidence of the vitality of the milling soap used, for if it is right the washer will be filled up with a thick, rich, creamy lather, which becomes dirtier by running as the impurities wash out. When the goods show such a liquor, no scouring agent will be required for washing them off beyond warm water and a little ammonia to free the soap, the procedure of scouring being simply to run off the suds after ten minutes' running, and add a fresh supply of warm water.

At this second scouring the lather should show up thick and creamy, but this time it should be white, and this should be gradually rinsed out with several small additions of warm water, followed up by a final rinse with cold. The time for scouring and rinsing out the soap depends naturally upon whether the water is hard or soft, and also upon the kind of soap used in the milling; while rinsing with cold water only, takes a considerable longer time to get the soap out than with warm. When at the addition of the first water the lather does not show itself to any extent, and the suds look thin instead of thick and creamy, this is a sign that the vitality of the milling soap has gone, and in this case several pailfuls of a good strong scouring liquor should be given.

The action of ammonia as an alkali for neutralizing fatty acids is strong. It saponifies these much better than potash or soda, and only its volatility makes it unsuited for the manufacture of textile soaps, but it is largely used as an agent for expediting the combination of other alkalies with the fats. This also explains its capability of increasing the action of other alkalies in scouring, as well as that of soap. When ammonia is poured on cloth charged with soap, at the beginning of the scouring process, a much larger volume of foam will be formed, while the dirt will rise better and quicker, and the cloth will be cleaned more effectively. Ammonia is not only useful for causing the dirt to rise, but it also expedites the rinsing out of the soap, a most important feature in connection with goods which have to be dyed.

As all dyers are aware—traces of soap will remain in the cloth in spite of the most slow and careful rinsing, and these residues, when brought into contact with acid, are at once split up into free fats which act as a resist. The addition of a little ammonia just before the final completion of the washing process causes this soap residue to rise, when it is then readily cleared away with the wash waters, and some dyers, in treating scoured material, always give a preliminary boil out with ammonia to make sure of things. When added to the washer, the ammonia should be diluted with about three times its bulk of clean cold water, giving half the measure at the beginning to help the milling dirt to rise; then, when the worst dirty lather has been rinsed away, add the remainder. This last portion will cause a strong lather to form again, bringing away with it the last traces of soap, while wherever fullers' earth is used a little ammonia is always beneficial when used along with it.

There is very little danger of modifying the color of dyed goods by using ammonia in the wash waters, as the solution is a very dilute one, and most goods which require much cleaning are dark shades. Alkali blues will not stand it, without having a final

acid bath given to bring the color back, but all the wood dyes, alizarine, indigo, and others, may be washed off with earth and ammonia without any fear of the color altering. So far as the handle of the goods is concerned, ammonia has the least action of any of the alkalies, and for this reason so many of the old scourers pinned their faith to stale urine, which is known technically as old wash or lant. The use of ammonia requires, however, one precaution, and that is not to allow it to come into contact for any length of time with copper or brass fittings. When this occurs, the metal is acted upon by the ammonia to form cuprous ammonia, which stains white cloth so feebly as to be hardly noticeable before dyeing, but become developed stains so soon as the dye is applied.

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AN IMPROVED PROCESS OF DYEING

A process of dyeing with the anthracene colors or synthetic indigo has recently been patented in this country and is described by the inventor as follows: It is the usual practice with dyes of this class to render them soluble by a reducing agent and while in the reduced state deposit them upon the fiber. The dye is subsequently reoxidized which gives the permanent color toward washing and light characteristic of these dyes. It is customary to prepare such dyes for use by dissolving them in an alkaline bath containing either caustic soda or carbonate of soda or both, also hydrosulfite of soda, the last named serving as the reducing agent. The bath prepared in this way, however, is not entirely satisfactory although the solution of the dye is substantially complete, for the reason that the dye deposits so rapidly on the fiber that an even shade is very difficult to obtain. This is particularly true of mercerized yarns having a base of hydro-cellulose, though it is true in greater or less degree of all vegetable fibers, especially where they have been previously submitted to strong alkalis. The difficulty is especially pronounced in machine dyeing, so much so that the use of dyestuffs of this class is greatly reduced where the machine process is employed.

If the alkali heretofore employed is replaced by sulphide of soda in the reducing bath and the latter employed with the usual hydrosulphite the objection above noted is obviated and not only is the material dyed an even shade, but less hydrosulphite and dye are required and the dyeing operation is more economical. In this process the hydrosulphite of soda remains the reducing agent and the sulphide of soda replaces the alkaline reagents heretofore used. It is old in this art and in connection with certain of these dyes to employ sulphide of soda as the reducing agent in place of the hydrosulphite generally used. The last mentioned process is not entirely satisfactory since it is not so fast and the shade produced is dull. Where hydrosulphite is the reducing agent these difficulties do not appear.

The quantity of solution and the proportions employed depend on the particular method of dyeing. For example, for machine dyeing ten pounds of crystals of sulphide of soda is used, to one hundred gallons of solution, and hydrosulphide of soda to the extent of from 1 to 1 1/2 per cent. of the weight of the material to be treated. If open vat dyeing is employed the proportion of hydrosulphite is somewhat increased.

The dyeing operation when this process is employed is extremely simple. When an open vat is used the solution is made by introducing the sulphide of soda and hydrosulphite of soda in the proportions stated above into a vat containing water to the amount of from fifteen to twenty times the weight of the material to be dyed. In the machine process the amount of solution required is less, usually from five to six times the weight of the material to be treated. Before the dye is introduced the bath must be brought to the proper temperature for the particular dye employed. After the dye has been put in, the bath must be stirred at intervals until the dye is thoroughly reduced and dissolved. In the case of the open vat treatment the material to be dyed is simply put into the vat, but in the machine treatment the solution is usually let in on to the material to be dyed. The dyeing operation in either case may be conducted in the usual or approved manner, and is generally completed in about forty minutes.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 97

BLUE ON WORSTED DRESS GOODS

Blue on 100 lbs. worsted dress goods. Prepare dye bath with

1 oz. 402 gr. Amazo Blue.
2 ozs. 365 gr. Amazo Fast Pink Y.
41 gr. Amazo Fast Yellow 6G.
(American Dyewood Co., 80 Maiden Lane, New York, N. Y.)
1½ lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 120°, raise to a boil and boil 3/4 hour or to shade.

The above colors are noted especially for their level dyeing properties and good fastness to light and are recommended for all classes of wool dyeing.

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Recipe No. 98

RED ON WORSTED DRESS GOODS

Red on 100 lbs. worsted dress goods. Prepare the dye bath with

1 lb. 12 4/5 ozs. Amazo Violet 4R.
1 lb. 8 ozs. Amazo Brill. Red 6B.
1 lb. 8 ozs. Amazo Brill. Rose 3B.
(American Dyewood Co., 80 Maiden Lane, New York, N. Y.)
3 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 120° F., raise to a boil in 20 minutes and boil 3/4 to 1 hour or to shade.

The colors used to produce the above shade are of very good all round fastness and are recommended for piece goods dyeing, because of their very good leveling properties.

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Recipe No. 99

RED ON WORSTED YARN

Cloth Red G F L on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Cloth Red G F L.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
10 lbs. Glauber's Salts (Crystals).
3 lbs. Acetic Acid.

Enter at 120° F., raise to a boil during 1/2 hour and dye at a boil for 1/2 hour.

Then add

2 lbs. Acetic Acid

and boil 1/2 hour longer or until the bath is practically exhausted.

Cloth Red G F L dyes wool in a mildly acid bath, without after chroming, giving very good fastness to washing and good fastness to light and milling. Its fastness in these respects, however, is improved somewhat if after chromed, or used as a meta-chrome color.

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Recipe No. 100

BLUE ON COTTON YARN

Naphtamine Brilliant Blue G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Naphtamine Brilliant Blue G.
(Kalle & Co., 530 Canal St., New York, N. Y.)
20 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Naphtamine Brilliant Blue G possesses remarkable brilliancy for a direct cotton color.

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Recipe No. 101

GREEN ON COTTON YARN

Paranil Green B on 100 lbs. cotton yarn. Prepare the bath with

4 lbs. Paranil Green B.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystal).
2 lbs. Soda Ash.

Dye at 200° F. for an hour, then rinse. Dyed yarn is then coupled by working in cold bath for twenty minutes made up as follows

2 lbs. Paranitraniline.
4½ lbs. Concentrated Hydrochloric Acid.

On stirring complete solution takes place. Pour the solution slowly while stirring into

7 gals. cold water as cold as possible.

The Paranitraniline thereby separates out again. The temperature of the mixture must not exceed 70° F. Then add a solution of

1 lb. Sodium Nitrite in
½ gal. Cold Water

and stir. Complete solution takes place. After about twenty minutes pour the solution through a piece of cloth into the developing bath and finally add

4½ lbs. Sodium Acetate Cryst.

dissolved in about 2 1/2 gals. of water.

Paranil Green B. possesses good fastness to washing and in general the properties characteristic of direct cotton colors.

Recipe No. 102

BLACK ON WORSTED YARN

Kresol Black K V on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Kresol Black K V.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystal).
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Kresol Black K V does not stain white cotton threads and possesses good fastness to decatizing.

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Recipe No. 103

YELLOW ON WORSTED YARN

Chrome Yellow R O on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Yellow R O.
(Bayer & Co., 117 Hudson St., New York, N. Y.)
5 lbs. Acetic Acid.
15 lbs. Glauber's Salt (Crystals).

Enter yarn at 120° F., raise slowly to a boil and dye at a boil for 3/4 hour, then add

2 lbs. Sulphuric Acid

and continue boiling for 3/4 hour.

Finally after-treat for 1/2 hour in a bath containing

15 lbs. Potassium Bichromate.

Chrome Yellow R O possesses good fastness in general.

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Recipe No. 104

RED ON COTTON YARN

Oxamine Brilliant Red B X on 100 lbs. cotton yarn. Prepare the dye bath with

1½ lbs. Oxamine Brilliant Red B X.
(Badische Co., 86 Federal St., Boston, Mass.)
40 lbs. Glauber's Salt (Crystal).

Enter at 180° F. and dye at a boil for one hour.

Oxamine Brilliant Red B X possesses very high coloring power.

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Recipe No. 105

YELLOW ON WORSTED YARN

Azo Yellow 3 G N Conc. on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Azo Yellow 3 G N Conc.
(Innis Speiden, 46 Cliff St., New York, N. Y.)
20 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter yarn at 140° F. and dye at a boil for one hour.

Azo Yellow 3 G N Conc. is a very level dyeing color of satisfactory fastness for most purposes.

Recipe No. 106

SCARLET ON COTTON YARN

Diamine Azo Scarlet 2 B L Extra on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Azo Scarlet 2 B L Extra.
(Cassella Color Co., 182 Front St., New York, N. Y.)
40 lbs. Glauber's Salt (Crystals).

Dye at a boil for one hour, then diazotize by working for 20 minutes in a cold bath made up with

2½ lbs. Sodium Nitrite.
3 lbs. Sulphuric Acid.

Rinse and develop by working 20 minutes in a cold bath made up with

1½ lbs. Beta Naphthol

dissolved in the necessary amount of caustic soda solution.

Diamine Azo Scarlet 2 B L Extra possesses very good fastness to washing.

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Recipe No. 107

VIOLET ON WORSTED YARN

Chromogene Violet B on 100 lbs. worsted yarn. Prepare the dye bath with

2½ lbs. Chromogene Violet B.
(Farbwerke Hoechst, 122 Hudson St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystals).
3 lbs. Acetic Acid.

Enter at 120° F., bring bath slowly to a boil and after boiling 1/2 hour add

2 lbs. Sulphuric Acid

and boil 1/2 hour longer

Finally after-treat in a bath containing

1½ lbs. Potassium Bichromate

at a boil for 1/2 hour.

Chromogene Violet B is the first of a new series of chrome developing colors, which give a remarkable clearness of shade combined with good fastness.

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Recipe No. 108

BLACK ON WORSTED YARN

Kresol Black X T on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Kresol Black X T.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
20 lbs. Glauber's Salt (Crystal).
4 lbs. Acetic Acid.

Enter at 120° F., dye at a boil 3/4 hour, then add

4 lbs. Sulphuric Acid

and continue boiling 1/2 hour longer.

Kresol Black X T in addition to being an excellent black for straight wool dyeing, is also suitable for union dyeing.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Cleaning Waste Machine. Wilhelm Rothe, Reichenbach, Alsace, Germany. An improved apparatus for converting yarn waste into a form suitable for wiping waste.

Electric Light Reflector. The National X-Ray Reflector Co., Chicago, Ill. An improved reflector for electric lighting. A description appears in this issue.

Pattern Device for Cloth Shears. Paul Klug, Crimmitschau, Saxony. An attachment for cloth shears by which the nap is raised in stripes by a napping cylinder. This produces patterns when the cloth is sheared.

Air Cooling and Humidifying Apparatus. J. A. Hart, Blackburn, England, has recently introduced an improved ventilating and humidifying apparatus for mills.

Electric Feeder. L. H. A. Schwartz & Co., 40 Central St., Boston, Mass. An electric automatic feeder for tentering machines and calenders. It is very simple in construction, takes up a small amount of space and can be attached to any electric lamp socket.

Sewing Machine. The Twin Bobbin Sewing Machine Co., Accrington, Eng. A shuttleless sewing machine, which is operated with twin bobbins, thus dispensing with the necessity of refilling a shuttle.

Ring Spinning Frame. J. J. Rieter & Co., Winterthui, Switzerland. A ring spinning frame provided with a speed regulator for adjusting the speed of the machine to the movement of the thread from the base to the top of the cone. It is claimed that in this way the tension on the thread is kept uniform and as a result the frame can be run at a much higher speed.

Picker Spindle. John Nesbitt, Manchester, Eng. A picker spindle which is self lubricating. A hollow shaft is used and the bore is connected with an oil reservoir.

Feed Dog for Buttonhole and Tacking Machines. Jones & Hardy, Hudson, N. Y., have recently placed on the market an improved Perkins toggle friction feed dog for buttonhole and tacking machines of the Singer class. This device is being used by a number of manufacturers and is giving satisfaction.

Warping Knitting Machine. Wilhelm Bach, Apolda, Germany. An improved warp knitting machine with vertical needle bars.

Vacuum Machine for Cleaniug Cards. Paul Kestner, Lille, France. An attachment for cleaning cards by a vacuum suction device, which is vibrated from one side of the card to the other.

Boiling Size. E. and P. Bott, Colmar, Germany. An apparatus for boiling the size mixtures for yarn and cloth.

Yarn Drying Machine. Franz Franken, Tilburg, Holland. A machine for drying the yarn on cops. The yarn is wound on perforated metal cops and hot air is forced through it.

Double Reed. W. N. Brown, Inver Factory, Ltd., Larne, Ireland. A reed for weaving closely set linen cloth. The reed wires are set in a double row, the wires in the back row being heavier than that in the front one. This difference in the size of wire, it is claimed, prevents the cloth having the thin, bunchy, streaked appearance that is sometimes caused when the same size wire is used for both rows.

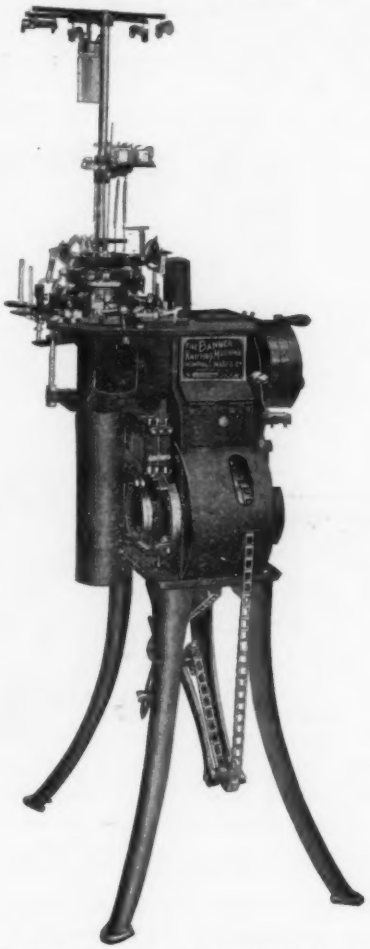
THE NEW "BANNER" SPLIT FOOT AND DOUBLE FEED HOSIERY MACHINE

Hosiery manufacturers will be greatly interested in the new "Banner" split foot and double feed hosiery machines built by the Hemphill Mfg. Co., Pawtucket, R. I. The new model split foot machine, shown at Fig. 1, is specially adapted for high grade seamless stockings, either ladies' or half hose. It does away with all of the objectionable features caused by the high splice and double sole yarns that are cut so short as to pull through the outside of the stocking, or left so long that they leave a very unsightly ragged edge showing through in the light weight stockings.

The new model split foot machine is simple in construction, and is fully automatic in all its movements. It has four yarn changers on one side, and one movable yarn changer on the opposite side, making five in all. Having this movable yarn changer to run the secondary yarn does away with the idling of the split-sole yarn, while the machine is knitting the heel and toe. Tender yarns can, therefore, be used with the utmost safety, and there is no fretting whatever on any of the yarns while the stocking is being made. The split foot stocking is the ideal seamless hose or half-hose, presenting a neat and finished appearance, as there are no loose ends to show through the fabric.

The product of this machine compares very favorably with the full fashioned stocking having a garter top, silk high-splice, reinforced heel and toe, and a cotton sole, without the unsightly seam in the back or the uncomfortable seam in the foot. It has been demonstrated with the new model Banner split-foot machine that in making silk hosiery there is a considerable saving by being able to substitute a cotton yarn in the bottom of the foot, overcoming the additional expense of having to reciprocate through the foot.

Aside from silk work this machine produces a superior quality of black leg and white foot work. This stocking is especially popular in grades of work from 200 needle down. On this black and white work the qualities of the new seam in the split-foot are more particularly noticeable. The black and white stitches forming the seam alternate evenly, producing a very pleasing effect and adding much to the appearance of the stocking. This seam is very elastic and in

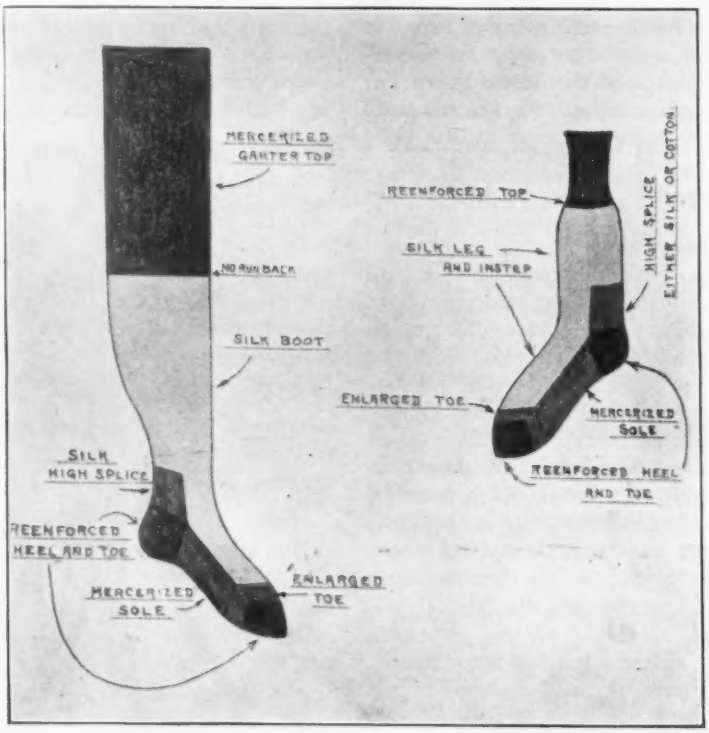


THE "BANNER" SPLIT FOOT HOSIERY MACHINE.

every way as strong as any other part of the fabric. If at any time the change in style or season demands a different line of goods, this machine can be easily altered to a plain machine by disconnecting a few parts and is then capable of producing any of the numerous combinations to be made on the regular Banner.

NEW MODEL DOUBLE-FEED MACHINE

The new model double feed machine making two courses for each revolution of the machine is now ready for delivery. This machine has five yarn changers, and does away with floating the double feed thread while making the heel and toe. It can also make the popular garter top stocking with the no-ravel stop, and put in a high spliced heel and



TWO COMBINATIONS MADE ON THE NEW MODEL "BANNER" SPLIT-FOOT HOSIERY MACHINE.

pairs per day. The new double feed machine will be a great advantage in making hosiery of either combed or carded peeler yarns. With the number of needles mentioned above, there will be no noticeable difference as to the variance of the courses by the two sets of cams. On very fine gauges this perhaps would be an objection to using a double feed.

double sole. The new model double feed machine is especially well adapted for the cheaper grades of hosiery from 200 needle down to as coarse as 72 needle.

It has a movable change of yarn lever that handles the double feed or secondary yarn while knitting down the leg portion of the stocking, therefore doing away with the objectionable feature of idling the secondary yarn while making the heel and toe.

It is simple in construction and fully automatic. The production on 188 needle goods would be approximately 6 1/2 to 7 dozen

The running-on attachment is adapted to press off each stocking after it is finished, thereby making each stocking of a uniform length, and removing the necessity of stopping the machine to cut the fabric.

Like the new model split-foot this double feed machine may be easily changed to a regular single feed for the manufacture of plated work, etc., whenever a difference in style demands it. All parts of the machines are manufactured from the very best material and all adjustments are easily accessible from the front.

THE COWAN TRUCKING SYSTEM

The truck manufactured by the Cowan Truck Co., Holyoke, Mass., one of which is shown loaded at Fig. 1, have been introduced into over fifteen hundred factories where they have proved of great value in the saving of labor and time. The advent of the multiple platform system marked a great improvement in trucking within factories. Side by side with up-to-date and expensive machinery many manufacturers have been using obsolete systems of moving material. The manufacturers of Cowan trucks claim that the cost of installation of the platform system will be paid for in net savings during the first three months it is in use. The Cowan trucking system is not only economical to install, costing about one-fifth of what the old style four-wheel trucks cost, but it also does the work at about fifty per cent. of the ordinary cost. The raw stock or goods in process are placed on wooden platforms which have a clearance above the floor of 6 inches, and which cost about 75 cents each. When the goods are to be moved it is only necessary to slip the Cowan transveyor under the platform, press down the handle which raises the wooden platform 1 5/8 inches from the floor and locks it automatically in place. The truck is now ready to haul to any part of the mill.

When unloading it is simply necessary to step upon a pedal and allow the handle to come slowly to a vertical position, releasing the heaviest loads without shock or jar. There is saved each time this operation is performed the labor and time necessary to pile the raw stock or goods in the process of finishing upon the four-wheel platform trucks and also the time and labor necessary to take the raw stock or goods in process of finishing from the platform truck and pile them on the floor when unloading. The actual time of hauling the goods would be about the same in both cases, but in the average mill four-fifths of the time consumed in trucking is spent in the loading and unloading. By operating the Cowan system and saving all the loading and unloading it is possible to save $1.60 on each $2.00 expended for trucking costs.

FIG. 1. THE COWAN TRUCK LOADED.

In the dyeing, drying, bleaching and finishing of cotton goods, the Cowan transveyor used in connection with multiple platforms has already been found by several concerns to effect a great saving. Further attention is called to the fact that at the dyeing machines and calenders the goods can be brought to one side of the machine on a platform, and after being worked can be taken out of the machine to an empty platform. The saving involved here is that the

manufacturer is tying up two inexpensive wooden platforms worth about 75 cents each, where otherwise he would be tying up two expensive four-wheel trucks which would cost at least $10 each. If the trucks were not placed on each side of the machine it is necessary to pile and unpile, and if this

THE COWAN TRUCK.

latter method is used the economy effected by the Cowan system is even greater than in the first case.

The application of the system to the different departments depend upon the lay-out of the mill. It has been found that each factory superintendent or manager can adopt the form of transveyor and platform best suited to his plant. The Cowan Truck Co. make the transveyor in three styles and six sizes. The transveyors are built to fit the requirements.

In addition to the economies effected in the actual process of manufacturing there are equally large economies to be effected in the storage room. With the Cowan trucking system about 30 per cent. of the floor space can be saved. This is possible because goods can be piled four rows deep in the store-room, then an aisle, four more rows and then another aisle, and so on across the room. To get at the goods in the middle pile it is only necessary to slip the Cowan transveyor under the outside pile, pull it out into the aisle and go back and get the goods which are wanted in the second row. This consumes but a few moments and the saving in floor space offsets many times the amount of time consumed.

The Cowan Truck Co. will install their machine on trial, so confident are they of the successful operation of the system.

AN IMPROVED REFLECTOR FOR ELECTRIC LIGHTS

The introduction of the Tungsten lamp for general lighting has brought about some very important changes in the lighting equipment for mills and factories. The Tungsten lamp if used alone unshaded, is too brilliant and glaring for ordinary purposes, hence the manufacturers of reflectors have brought out new designs which are scientifically built to provide a comfortable lighting for the workman, and which are very efficient for the reflecting and distributing of light.

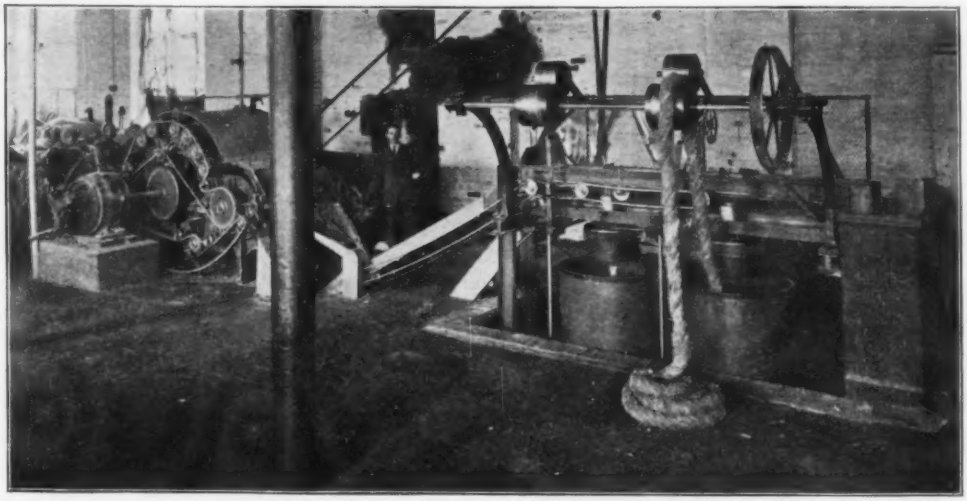
The new reflectors recently put on the market by the National X-Ray Reflector Company, Chicago, meet the requirements of modern reflector design, and have been very favorably received for mill lighting. Fig. 1 shows one of a series of reflectors known as the Bee Hive Trio. The three designs will take care of all lamp sizes from

AN IMPROVED REFLECTOR FOR ELECTRIC LIGHTS.

25 to 150 watt. The X-Ray reflector is made of corrugated glass in one piece with a coating of silver on the outside, which is protected by an elastic enamel backing. The inner surface of the reflector is given a fire glaze which makes the cleaning of the equipment a simple matter, since it is only necessary to wipe out the reflector with a dry cloth at regular intervals. The peculiar properties of the backing enamel used on this reflector add to its permanent qualities and prevent any tarnishing or deterioration of the reflecting surface.

BOA WIPING WASTE

We recently had an opportunity of inspecting a plant erected by William C. Jones, Ltd., Manchester, Eng., and 200 Summer St., Boston, Mass., for the purpose of demonstrating a new process of manufacturing wiping waste in rope-form, known under the registered trade mark as "Boa" waste. The installation consists of a 40-inch Tomlinson waste carding machine and the Boa attachment, which automatically receives and coils into rope-form all the waste that is put through the machine.



THE BOA WIPING WASTE MACHINE.

There are two features in connection with this new process which should appeal to every wiping waste manufacturer, the first being the greatly increased capacity of the plant over existing machines; and the second, the convenient form in which the Boa attachment delivers the product.

As regards the capacity of the plant the owners definitely state and are prepared to guarantee a production of at least 2,000 pounds per hour under ordinary working conditions with the ordinary raw material used in this country in the manufacture of wiping waste. This production has been exceeded by 50 per cent. with both colored and white waste even on the demonstration plant without having the advantage of properly trained hands. It is partly attained through a number of improvements to the waste carding machine which are all patented by the inventor. The improvement includes self-cleaning devices which prevent the breaking cylinder, rollers, clearers and doffer from lapping or clogging, thus doing away with frequent stoppages for cleaning the working parts of the carder. There is also a simple but ingenious contrivance for reducing the loss or shrinkage through the machine.

The second feature, the handy form of the product, is of as much importance to the manufacturer of waste as to the buyer. The former is able to market an article that appeals to the eye and the latter gets a product that suits his requirements much better than the old style of lap waste. The prime essential to the user of wiping waste is length and regularity so as to enable the worker to make neat wiping pads without any trouble, and without having to drop a lot of the material on the floor. This can be done with Boa wiping waste, in which practically all the threads are laid one way as against the jumbled mass in which wiping waste is marketed at present.

These advantages are obtained with the help of the Boa coiling attachment, which retains in the finished product the direction in which the threads have travelled through the waste carding machine. The original constructor of this machine knew exactly what he wanted, but it was left to the inventor of the Boa process to collect the product in such a manner as to increase its selling possibilities to the manufacturer and to enhance its utility to the user.

We are informed that Boa waste will shortly be regularly manufactured and marketed in this country.

TRUCKS FOR TEXTILE MILLS

It is a fact little appreciated, that the systematizing of the handling of goods and materials in considerable volume, will reduce the labor cost as much as 50 per cent. To accomplish these economies and also facilitate the progress of work passing through a factory, no class of equipment can be utilized to better advantage than floor trucks, if they are exactly adaptable to the requirements. Manufacturers of textiles have failed to keep pace with manufacturers in other lines in this

A STEEL TRUCK FOR A TEXTILE MILL.

respect, principally on account of the fact that there has been no suitable truck construction offered for the purpose, and secondly because the types of trucks that were most nearly adaptable were considered prohibitive as to price.

Trucks to be used not only as a means of handling textiles from place to place in a mill, but also as receptacles for goods or materials during the manufacturing operations should be sanitary to avoid soiling, smooth inside to avoid damage by breaking threads, and be easy of access so that operators and employes will consume the minimum amount of time in unloading and loading. They should also be sufficiently rigid to stand frequent and unavoidable bumping against each other, and sufficiently light in weight so they can be easily handled. Lastly, they should have a finish that will permit of wiping or washing, as a certain amount of dust or dirt will eventually accumulate in trucks that are in daily use.

The steel package trucks, manufactured by the Equipment Manufacturing Co., of Warren, O., are in use in complete systems in the plants of representative manufacturers of textiles and are said to have all of the features enumerated above. The systematic use of these trucks by delivering the work to each operator and also providing for receipt of all work, has been the means of greatly facilitating the factory output, and eliminating confusion among employes, utilizing floor space to better advantage by dispensing with bins, racks, tables, etc., and keeping a perfect check on the progress of the work at all times. The trucks are furnished to meet different conditions, with proper regard for aisle space, height of sewing table, space between operators' chairs and all other conditions in the factory.

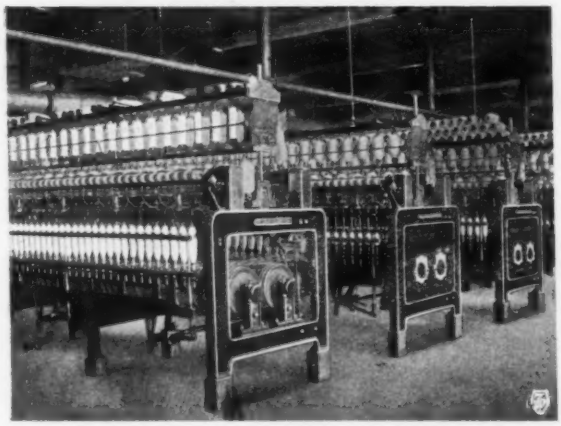
THE S. K. F. BALL BEARINGS

Progressive mill managers are today giving more attention than ever before to the question of minimizing producing costs. Greater economy in the mill means greater profits on the finished goods.

The machinery builder is on the alert for improvements to the machines, greater efficiency in their operation, simplification of the processes of manufacture, or some saving device which mean greater economy in cost of production.

Much time and thought has been given by textile mill engineers to (1) the analysis of electric group drive and individual drive as compared with the older type of transmission, (2) the operating efficiency of the main

power plant, steam engine economy, etc, (3) the profitable utilization of the goods that go to the scrap pile. Despite the attention paid to these questions, the heavy power consumption by the machines on his shop floor has been accepted as a fixed and necessary evil. The application of ball bearings on this type of textile machine is rapidly disproving



THE S. K. F. BALL BEARINGS ON A SPINNING FRAME.

the old fallacy that power wastage is a necessary evil.

The elimination of bearing friction by means of ball bearings is a feature which is vital to production costs, and as well to the initial costs of factory installations. It is vital to the initial costs of factory installations for the reason that a saving of 25 per cent. in the power to drive mill machinery means a proportionate reduction in the cost of the mill power plant. It is vital to production costs because the saving in the power required to drive producing machines effects a big item of saving on the factory power bill.

Ball bearings are rapidly extending their field of service and influence in the textile mills. On dryers for wool, cotton, hair, and other stock, several manufacturers report that the application of S. K. F. ball bearings on their machines has brought about a saving of 35 to 50 per cent. Further than this ball bearings require but little lubrication and practically no attention. By reason of the compact housings within which the bearings are enclosed, and the elimination of all oil leakage, these ball bearing dryers are endorsed by insurance underwriters as proof against the hazard of fire.

On napping machines, S. K. F. ball bearings have performed a similar service. One manufacturer of these machines uses ball bearings in the worker rolls and now employs 5 h. p. motor where 8 h. p. motor was required to drive this same machine before ball bearings were used. After a period of several months, operating eighty (80) hours per week, during which the ball bearings made over 390,000,000 revolutions, they were found to be in prime condition. Proof of reliable enduring service has been established beyond a dispute, wear is eliminated and the up-keep of such machines is practically nothing.

In several types of spinning frames, the employment of ball bearings on the driving cylinders alone has increased the efficiency of these machines between 5 and 7 per cent., the machines carrying 140 spindles at a speed approximately 10 per cent. above that attained on machines using plain bearings. When ball bearings were applied to the spindles as well as to cylinder bearings, a saving of over 25 per cent. has been made.

These applications have been cited to emphasize the savings which may be effected on machines running on the shop floor. There

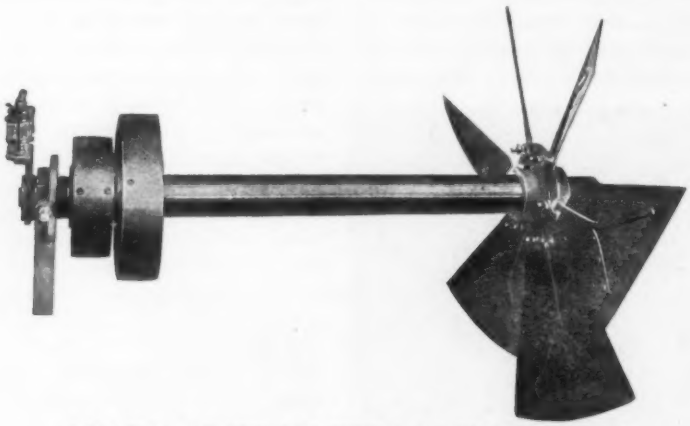
PARTS OF THE S. K. F. BEARINGS

are many types of textile equipments where similar economies can be brought about. In mill line shafting, there is the same opportunity for the mill owner to reduce power costs. Long and exhaustive tests have indicated that in many textile mills the power required to drive the line shafting alone is

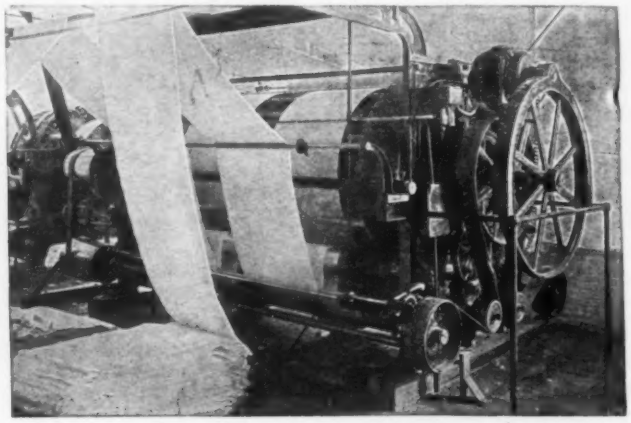
from 25 to 40 per cent. of the power employed in the entire mill. Ball bearings are power savers, lubricant savers and labor savers. In power consumed it is claimed that ball bearings require about 1/10 of the power ordinarily used by plain, babbitted, bronze or cast iron bearings. Many users state that they lubricate ball bearings once in three or four months, while plain bearings are soaked in an abundance of oil twice a week and sometimes oftener.

Ball bearings must be made of a very high grade of material, accurately finished, and must provide within themselves for compensation for the shaft spring and change in alignment.

The features which have been named have a direct bearing upon the efficiency in production, upon the labor and expense of maintenance, and upon the life of the manufacturing units. Mill owners who are anxious to realize a larger output for a given investment, an increased production for a given unit of manufacturing cost, or a reduction of the shop maintenance charges, can profitably investigate the most advanced type of machines using ball bearings when they next purchase new units for the mills.



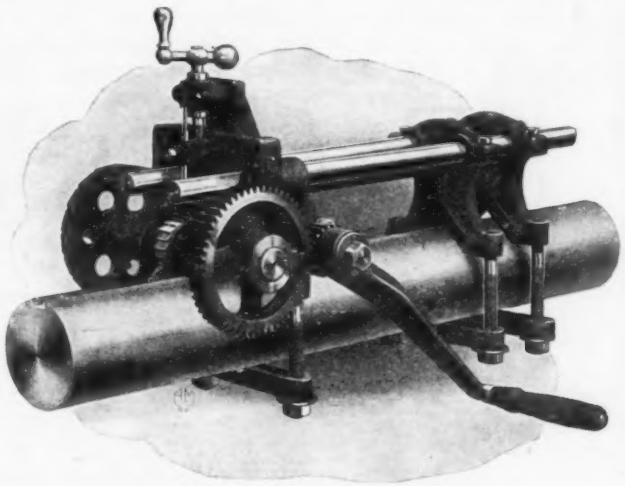
A FAN SHAFT FOR DRYERS ON WHICH S. K. F. BEARINGS ARE USED.



THE S. K. F. BALL BEARINGS ON A NAPPING MACHINE.

THE BURR PORTABLE KEYSEATER

The machine shown in the illustration is built by John T. Burr & Son, 492 Kent Ave., Brooklyn, N. Y., and will mill keyseats in the middle or on the ends of a shaft without removing the shaft from the hangers or boxes. The machine can be slipped over heavy shafting or spindles, and keyseats cut accurately and rapidly. It will mill a keyseat 12 inches long without resetting, and as there is a sliding support under the cutters steady the cut. The adjustment of the steel cutter arbor so that the different widths of keyseat shall be central in the shaft, is rapidly made without the use of spacing collars. This is accomplished by loosening the driving gear and the large sprocket and, after placing the cutters central again, fastening these parts. A set of milling cutters, made from special steel, is furnished with each machine. By using one or more of these cutters on the spindle, keyseats of any stand-



THE BURR PORTABLE KEYSEATER.

at all times, it cuts without chatter or jar and produces keyseats with straight sides and smooth bottoms. The illustration shows the No. 1 portable keyseater at work on a shaft 5-inch diameter, its outside capacity.

The cutter is provided with an automatic feed while cutting, but this feed may be disengaged, if desired, and the cutter-head fed by hand. The feed-worm is of steel, of large diameter, and the worm wheel is hobbled. In resetting, the feed-worm is slipped out of mesh and the lead-screw is turned directly with the same handle that is used on the down-feed.

The two clamp heads, one of which is tapped and remains on the back of the tool, are always firmly fastened to the shaft. The main or cutter head is fed along the shaft, its binder being tightened only enough to

ard width may be milled full width at one operation.

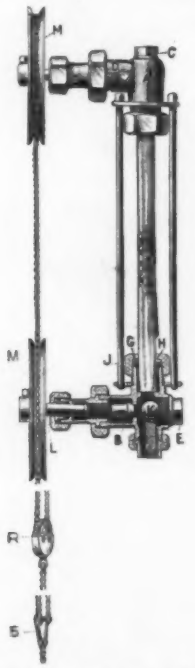
The main head and slide carrying the cutters are milled and scraped; the main head is wide and the slide is gibbed to it with an adjustable gib. The gears and worm-wheel are cut from the solid and are of proper width of face. The cutter slide is provided with an adjustable depth gauge showing the depth being milled. Accurate keyseats may be cut in the most cramped places, and the tool will work in almost any position. Over 4,000 of these machines are in successful operation.

The Burr keyseater is invaluable in repair, alteration and erection work and is in use in the best mills, mines, refineries and factories. Keyseats may be cut at the noon hour in many cases and delays and shut-

downs prevented. Alterations may be quickly made and often the machine will more than pay for itself on the first job.

THE "MONITOR" AUTOMATIC WATER GAUGE

The water gauge shown in the illustration was designed and patented by The Lunkenheimer Company, of Cincinnati, O., who are the sole manufacturers. There are quite a large number already in use, all of which



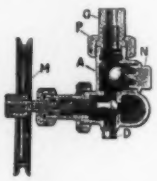
THE "MONITOR" AUTOMATIC WATER GAUGE.

are giving perfect satisfaction. They are made in two patterns, medium and extra heavy, for 200 and 300 pounds working pressures respectively. They are made either right or left hand, as desired, to facilitate the operation of the gauge.

Should the gauge glass break, the ball check valves, K, will automatically seat themselves, owing to the rush of steam and water on one side, and the lack of pressure on the other. This automatic closing feature is a valuable one, as it prevents the escape of steam and water, and permits the safe closing of the hand operated valves for the purpose of renewing the glass.

To renew the glass, it is only necessary to loosen the stuffing-boxes, G, take off the cap, C, remove the broken glass and substitute a new one, after which the stuffing-boxes are tightened and the cap, C, replaced. The change can be performed with perfect safety, for, owing to the quick-closing valves, which should be closed upon the discovery of the broken glass, there is no danger to be anticipated from escaping steam and water.

Particular care has been exercised in the design of the gauge to facilitate cleaning,



THE "MONITOR" AUTOMATIC WATER GAUGE.

and access can be readily had to any part. The plugs, C, D, R and N, are provided for this purpose. By removing the plugs, D, and opening the regrinding valves to their greatest extent, a rod can be inserted entirely through the body and tail pieces, and any sediment that might have collected in or around the entrance of the tail pieces can thereby be easily removed. By unscrewing plugs, E and N, the check balls will of their own accord fall from the body, as they rest on inclined surfaces.

It has been the practice heretofore to attach both pulleys together by means of a chain or cord, which was pinned to the pulleys, so that the proper closing of one depended entirely on the other. While in some cases this method was satisfactory, it has been found that unless great care was exercised in pinning the chain to the pulleys, or after the valves had been reground several times, one of the valves would not seat properly. To overcome this difficulty, the arrangement illustrated herewith was designed, by which it will be readily seen that both valves can be made to positively seat independently of each other. This ar-

rangement consists of a block pulley operating over a chain, which is pinned to both the upper and lower pulleys, this method being employed for closing the valves. Should one of the valves become closed before the other, a continued pull on the block chain will close the other. To the left of the pulleys, the chain is merely attached to a triangular plate, as the opening of the valves need not be regulated to as fine a degree as the closing thereof.

The valves are constructed on the same principle as the Lunkenheimer regrinding valves, and can easily be reground when worn. The valve seat opening is very large, being nearly twice the diameter of any other quick-closing water gauge on the market, and consequently a free and unobstructed passage for the water and steam is insured. The gauge cannot show a false level, as the ball checks are so constructed that unless the glass breaks, they will, owing to their weight and position, fall away from their seats.

The Lunkenheimer Company has issued an attractive booklet describing and illustrating this gauge, which they are distributing free to anyone desiring a copy. This gauge has been given the trade name of "Monitor".

INERTIA AND THE PART IT PLAYS IN MECHANICS

BY CHESTER REESE, M. E.

Inertia is that property of a body by virtue of which it tends to continue in either a state of rest or of motion in which it may be placed, until acted on by some force which causes it to change. Inertia plays an important part in mechanics and while in some cases it is desirable to bring the matter of inertia down to a minimum, yet in the majority of instances the presence of sufficient inertia is important and usually absolutely essential.

The driving pulleys on large planers as used in machine shops are usually made of aluminum so that they will be as light as possible and with small fly wheel effect, in order that the direction of motion of the planer bed may be quickly and easily reversed. This is a case where a reduction of inertia is desirable.

The large band wheels on a band saw as used in a wood-working plant are made of a so-called bicycle construction with light spokes and rim to reduce the weight of the wheel all possible, it having been found that if the band wheels are at all heavy, there is a considerable slippage of the saws on the wheels, particularly when the logs or timbers are first moved up to the saw. The slippage heats the saws, impairs their temper and causes frequent breakage and other bad results and embarrassments. This, then, is another of the limited number of cases where the elimination of inertia is desirable.

On the other hand, in the majority of instances, particularly where variable loads are encountered or where the maintenance of a steady speed and the even running of equipment is desirable, the matter of inertia must be liberally provided for.

An every day illustration of this, familiar to everybody, is the steam engine with its large fly wheel, which fly wheel is to enable the engine to keep approximately constant the velocity of rotation. The weight of the fly wheel is increased or decreased by the engine builders as the necessity for a constant speed is increased or decreased. The more the wheel weighs the steadier will be the action of the engine.

The lightest pulley made is the wood pulley. It weighs very much less than any other type of pulley ever made or which can be made. In many cases, this lightness is desirable; in other cases it is a disadvantage. The operation of factories by electric motors is now quite usual, and the general method of installation is to drive a group of machines from a line shaft which is in turn driven by a motor. In all installations of this character, the use of line shaft pulleys possessing a reasonably substantial weight is important. The aggregate weight of these pulleys provides that inertia, or that fly wheel effect, if it is preferred to call it that way, which steadies the load upon the motor, increasing its efficiency, relieving it from severe momentary shock, and reducing the consumption of current. As certain machines are thrown in and out of service,

or as certain shocks may be encountered by the machines in the regular operation, the inertia in the line shaft equipment absorbs these variations in load, and makes possible the maintenance of a practically constant velocity of rotation.

Where electric motors are employed, the Dodge "Standard" iron split pulley on the lineshafts which are driven by these motors have been found of particular value and adaptability in that particular service. The development of this pulley has gone hand in hand with the development of the use of the electric motor, and it provides that feature necessary for the most successful and efficient operation which is not and cannot be provided by the motor itself.

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FLATLOCK SEAMING MACHINES

Knit goods manufacturers will be interested to learn of a new type of machine that has recently been subjected to an exhaustive test of efficiency and speed, the results of which we confidently believe will have a more important influence in the knit goods trade than has been exerted by any previous development in the industry. Fifty of the new machines in one plant alone are producing in one operation at high speed an abutted-edge flat seam on two piece garments as well as on union suits, which will bear well-known trade-marks of two large jobbing houses and be distributed to the retail trade within the next sixty days. For years there has been a steadily increasing demand for such a finish on underwear, and many devices have been contrived to bring about this much desired result. Heretofore, however, none has been successful. This new seam (one thickness only of the fabric) is strong, absolutely flat, attractive to the eye, and commands instant attention.

When sleeves or legs are sewn up their length the abutted edges forming the flatlock seam are worked off the arm instead of onto the arm of the machine, thus effecting great economy in handling the garment.

The Willcox & Gibbs Sewing Machine Company, who own many domestic and foreign patents on the machine and its product, authorize us to contradict a report prevalent in the trade, that a large New England mill has exclusive control of the machine. Now that the mill tests have reached a successful issue a larger lot of machines are in process of construction, and these, together with the stock now in hand, will soon enable the company to meet the demands of the trade for this machine.

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DYEING THE WOOD OF THE LIVING TREE

Dr. Kleinstuck, of Hellerau, has succeeded in dyeing the wood of growing trees by causing the sap to carry dyes, or bodies which form a coloring matter with the lignine of the wood. Many substances of each class have been found which appear to have no injurious effect on the vitality of the plant. The procedure consists in boring horizontal holes, one or more according to the size of the tree, right through the center of the trunk. One end of the hole is stopped by a cork, and the other receives the tube bringing the liquid to be injected. The cork is occasionally removed if necessary to permit the escape of air.

The dyes used must be soluble in water, readily diffusible from cell to cell (in other words, readily crystallizable), and must be fast to light, in view of the use of the dyed wood after the tree has been felled. Some dyes are, of course, unsuitable, either because they are loose to light, or because they injure the tree, or because they give unlevel dyeing, or for combination of these reasons.

Dr. Kleinstuck mentions, for example, that Malachite Green and Methylene Blue give perfectly level dyeings in birch, while Eosine merely produces red veins in the wood. Of the second class of bodies, hydrochloride of aniline and paraphenylene diamine deserve special notice. The former gives with the lignine a fast yellow, the latter a beautiful salmon-red. With both classes of liquids, the solutions should be of from 1/2 to 1 per cent. strength.—The Dyer & Calico Printer.

Personals

A. H. Watson has been appointed superintendent of the Draycott Mills Co., New Hartford, Conn.

Henry D. Arnold, overseer of dyeing at the Apponaug Company, Apponaug, R. I., has resigned to accept a position at the Newburgh Bleachery, Newburgh, N. Y. His position at the Apponaug Co. will be filled by Harry G. Crowthers, who was formerly his assistant.

William H. Mitchell has accepted the position of overseer of carding at the Versailles Sanitary Fibre Mill, Versailles, Conn. He was formerly employed at the Totokett Manufacturing Co., at Versailles.

Martin O'Toole has accepted the position of overseer of finishing at the French River Textile Co., Mechanicsville, Conn. He was formerly employed at the Bellevue Mill, Clinton, Mass.

John A. Cronin has accepted the position of overseer of finishing at the Crawford Woolen Co., Martinsburg, West Va. He was formerly employed at the Brickner Woolen Mills Co., Sheboygan Falls, Wis.

Fred Donahue has accepted the position of overseer of weaving at the Mayo & Son's Mill, Foxcroft, Me.

William D. Turnbull has accepted the position of designer at the Robert Dobson Co., Pioneer Woolen Mills, Pittsfield, Me.

William McKeel has accepted the position of overseer of dyeing at the Galt Robe Co., Galt, Ont., Canada. He comes from Hespeler, Ont.

W. N. Darby has been appointed overseer of carding and spinning at the Brevard Cotton Mills, Brevard, N. C. He was formerly employed at the Panola Mills, Greenwood, S. C.

M. W. Moore has acepted the position of overseer of weaving at the Jefferson Cotton Mill, Jefferson, Ga. He was formerly employed at the Woodside Mill, Greenville, S. C.

T. S. Clark has been appointed night superintendent of the Harden Manufacturing Co., Worth, N. C. He comes from Bessemer City, N. C.

W. Y. Harrison has been appointed superintendent of the Brevard Mills, Brevard, N. C. He comes from Greenwood, S. C.

S. S. Campbell has accepted the position of overseer of carding at the Lynchburg Cotton Mill, Lynchburg, Va. He comes from Chester, S. C.

L. L. Chandler has been appointed superintendent of the Seneca Cotton Mills, Seneca, S. C. He formerly held a similar position at the Apalache Mills, Arlington, S. C.

H. E. Bates has been appointed superintendent of the Apalache Mills, Arlington, S. C. He formerly held a similar position at the Merrimack Mills, Huntsville, Ala.

E. L. Hege has been appointed superintendent of the Twine Mills Corporation, Roanoke, Va. He was formerly employed at the Edna Mills, Reidsville, N. C.

Lawrence J. Carroll has accepted the position of overseer of spinning at the Plainfield Woolen Co., Central Village, Conn.

George E. Bullard has been appointed manager of the International Cotton Manufacturing Co., East Killingly, Conn., and Henry Oakley is superintendent for this company.

Hartwell Douglass has been elected president of the Alabama Cotton Mills, Speigner, Ala.

J. Z. Cleveland has been appointed treasurer of the Tucapau Cotton Mills, Tucapau, S. C.

W. T. Lang has been appointed general manager of the Orangeburg Manufacturing Co., Orangeburg, S. C.

T. A. Shipp has been appointed superintendent of the Piedmont Cotton Mills, Egan, Ga.

J. W. Jolly has accepted the position of overseer of weaving at the Lancaster Cotton Mills, Lancaster, S. C. He was formerly employed at Chesnee, S. C.

William Speirs, Sr., superintendent of the Follmer, Clogg & Company's Laurel St. Mill, Lancaster, Pa., for the past ten years, has severed his connection with that company. He is succeeded by E. D. Reddick.

Joseph H. Shinn, Jr., professor of cotton carding and spinning, knitting and silk manufacturing at the Philadelphia Textile School, Philadelphia, Pa., has severed his connection to become manager of the Notaseme Hosiery Co., Philadelphia.

Heywood Ramsden has accepted the position of overseer of finishing at the Waucantuck Mill, Uxbridge, Mass. He comes from Stafford, Conn.

Herbert Galusha has accepted the position of overseer of spinning at the C. J. Amidon & Son's Mill, Wilton, N. H. He comes from Lowell, Mass.

Edwin M. Converse, overseer of carding and spinning at the Faribault Woolen Mill Co., Faribault, Minn., has severed his connection with that company to accept a similar position with the Mankato Spinning & Knitting Mills Co., Mankato, Minn.

Linwood Green, overseer of dyeing at the Cocheco Woolen Manufacturing Co., East Rochester, N. H., has severed his connection with that company.

William Clapman has accepted the position of overseer of spinning at the Franklin Yarn Co., Franklin, Mass., on the night force, succeeding William J. Casey, who has resigned to accept the position of overseer of spinning at the Hewson Pure Wool Textile, Ltd., Amherst, N. S., Canada.

William J. Rollinson, overseer of finishing at the Waucantuck Mill, Uxbridge, Mass., has severed his connection with that company.

Hugo Schultz, overseer of finishing at the C. J. Amidon & Sons' Mill, Wilton, N. H., has severed his connection with that company.

T. J. Davis has accepted the position of overseer of carding at the Chinnabee Mills, Talladega, Ala.

G. W. Gilley has accepted the position of overseer of weaving at the Fitzgerald Cotton Mills, Fitzgerald, Ga. He comes from Danville, Va.

Charles F. McColl has accepted the position of overseer of spinning at the Woodside Mills, Greenville, S. C. He comes from Brevard, N. C.

John M. Davis has accepted the position of overseer of weaving at the Prattville Cotton Mill, Prattville, Ala. He comes from the Dwight Manufacturing Co., Alabama City, Ala.

Charles Crook has accepted the position of overseer of spinning at the Amazon Mills, Thomasville, N. C.

W. H. Gibson has accepted the position of overseer of weaving at the Capital City Mills Co., Columbia, S. C.

G. E. Hidd has accepted the position of overseer of the cloth room at the Capital City Mill, Columbia, S. C., succeeding George Liner.

B. J. Fisher has been promoted from paymaster to superintendent of the Merrimack Mill, Huntsville, Ala.

H. D. Tolbert has accepted the position of overseer of carding at the Fort Mill No. 2 Mill, Fort Mill, S. C. He comes from Greensboro, N. C.

J. M. Jordan has accepted the position of overseer of carding and spinning at the Paulding County Cotton Manufacturing Co., Dallas, Ga. He was formerly employed at the Newnan Cotton Mills, Newnan, Ga.

J. C. Walters has been appointed superintendent of the Park Mills, LaGrange, Ga. He was formerly overseer of carding at the Chinnabee Mills, Talladega, Ala.

C. L. Davis has accepted the position of overseer of spinning at the Caraleigh Mills, Raleigh, N. C. He comes from Roanoke Rapids, N. C.

F. T. Newberry has been appointed superintendent of the Selma Manufacturing Co., Selma, Ala.

A. P. Hurt has been appointed superintendent of the Glen Lowry Mills, Whitmire, S. C.

J. J. Bates has accepted a position as overseer of spinning at the Union Buffalo Mills Co., Inc., Buffalo, S. C. He was formerly employed at the Gainesville Cotton Mills, Gainesville, Ga.

W. E. Stafford has been appointed general manager of the Holt-Granite Manufacturing Co., Haw River, N. C. He was formerly employed at the Elmira Mills, Burlington, N. C.

W. F. Davis has accepted the position of overseer of weaving at the Shelby Cotton Mills, Shelby, N. C. He comes from Anderson, S. C.

C. M. Rafter has accepted the position of overseer of carding at the Manetta Mills, Lando, S. C. He comes from Fort Mill, S. C.

F. W. Allen, superintendent of the James Simpson & Company's mill at Scranton, Pa., has severed his connection with that company.

M. E. Bean has accepted the position of overseer of carding at the Chicopee Manufacturing Co., Chicopee Falls, Mass., succeeding James Hogan.

Arthur J. Peterson has accepted the position of overseer of dyeing at the Cocheco Woolen Manufacturing Co., East Rochester, N. H. He comes from Lowell, Mass.

G. W. Rollins has been promoted to the position of superintendent of the Henrietta Mill No. 2, Caroleen, N. C.

J. E. Jones has accepted the position of overseer of weaving at the Pomona Mills, Greensboro, N. C. He comes from Brookford, N. C.

Charles U. Surner has accepted the position of overseer of weaving at the Brander Mill, Concord, N. C. He comes from Welford, S. C.

G. W. Rollins has been appointed superintendent of the Henrietta Mill No. 2, Caroleen, N. C.

E. Richards, superintendent of the Lynchburg Cotton Mills, Lynchburg, Va., has resigned. The position will be filled by T. H. Henderson, formerly superintendent of the Toxaway and Anderson Mills, Anderson, S. C.

Joseph Richardson of Richardson & Weir, 1919 East Westmoreland St., Philadelphia, Pa., is spending a few months in Europe dèmonstrating a new dyeing machine for slubbing. During his absence his brother, John Richardson, formerly of the Cleveland Worsted Mill, Cleveland, O., is superintending the dye house.

Sidney H. Borden was elected treasurer of the Durfee Mill, Fall River, Mass., to succeed the late David Brayton, Jr. For a number of years Mr. Borden was a clerk in the office. He is a graduate of the B. M. S. Durfee High School, class of 1893 and is also a graduate of Harvard College.

At a recent meeting of the directors of the Humboldt Cotton Mill, Humboldt, Tenn., W. W. Baird was elected president and general manager.

Thomas E. Howard has been appointed superintendent of the Chace Mill, Burlington, Vt., succeeding the late William A. Trask.

Cornelius Donovan, overseer of weaving at the C. J. Amidon & Son's Mill, Wilton, N. H., has resigned.

Richard Arnold, overseer of carding at the Indian Spring Mill, Madison, Me., has resigned. He has been succeeded by John Elliott, formerly in charge of carding on the night shift in the same mill.

W. J. Battye, designer at the Stillwater Worsted Co., Harrisville, R. I., has severed his connection with that company.

Charles H. Birkby has accepted the position of superintendent of dyeing with John & James Dobson's Blanket Mill, Falls of Schuylkill Mill, Manayunk, Philadelphia, Pa. He was formerly employed as overseer of dyeing at the Wallace & Smith Blanket Mill, La Porte, Ind.

Albert Leach, overseer of carding at the North Village Mill of S. Slater & Sons, Webster, Mass., has severed his connection with that company to assume the position of superintendent of the New England Cotton Yarn Co., New Bedford, Mass. Mr. Leach has been in the employ of this company for twelve years.

Peter Ostigney, for several years second hand in the spinning department at the Social Mill, Manville Co., Woonsocket, R. I., has severed his connection with that company.

Thomas A. Donahue, second hand in the spinning department for the past fifteen years at the Fisher Manufacturing Co., Fisherville, Mass., has tendered his resignation.

Jonas Ramsden has accepted the position of overseer of dyeing at the Elmville Worsted Co., Danielson, Conn., He was formerly employed at the Bay State Worsted Co., Worcester, Mass.

James Quinn has accepted the position of overseer of finishing at the Saranac Mill, American Woolen Co., Blackstone, Mass. He was formerly employed at the Akela Mill, Pascoag, R. I.

Byron Newman has accepted the position of overseer of dressing at the Aetna Mill, Watertown, Mass.

William Burke has been promoted to the position of overseer of finishing at the Akela Mill, Pascoag, R. I.

Daniel McMichael, overseer of finishing at the Saranac Mill, American Woolen Co., Blackstone, Mass., has resigned.

Alois Melzer, overseer of dressing at the Aetna Mill, Watertown, Mass., has severed his connection with that company.

Richard T. Mills, overseer of spinning, has been transferred from the Halifax branch of the Dominion Textile Co. to the St. Anne's branch mill at Montreal, P. Q., Canada. The help in his employ presented him with a gold watch chain and Masonic charm, also a gold stick pin.

Alfred Arvisais has accepted the position of overseer of weaving at the Adams Woolen Co., Adams, Mass. He was formerly employed at the Oneko Woolen Mill, New Bedford, Mass.

Henry Blamire has accepted the position of overseer of twisting and spooling at the Pentucket Mills, Haverhill, Mass. He was formerly employed at the Ayer Mill, Lawrence, Mass.

Harry W. Swan has been appointed superintendent of the Winthrop Cotton Yarn Co., Taunton, Mass.

John D. Williams has accepted the position of second hand of weaving at the Shetucket Company, Norwich, Conn. He comes from Lowell, Mass.

Eugene Knight has accepted the position of overseer of weaving at the C. J. Amidon & Son's Mill at Wilton, N. H. He was formerly employed at the Sheridan Woolen Mills, Ashuelot, N. H.

Thomas R. Costello has accepted the position of second hand of dyeing at the George H. Gilbert Manufacturing Co., Ware, Mass.

George H. Brockenbrough, Jr., has been appointed secretary and treasurer of the Fidelity Mills, Charlotte, N. C.

E. W. Edwards has been appointed superintendent of the Elmira Mills, Burlington, N. C. He was formerly employed at the Monroe Cotton Mills, Monroe, N. C.

W. L. Boyd has accepted the position of overseer of carding at the Hoskins Mill, Charlotte, N. C.

W. R. McAbee has accepted the position of overseer of spinning at the King Mill, Augusta, Ga., succeeding P. B. Crouch.

G. M. Lamar has been appointed superintendent of the Lily Mills, Spray, N. C., in addition to the Nantucket Mills of that place.

R. P. Scruggs, formerly superintendent of the Henrietta Mills, Caroleen, N. C., has accepted a similar position with the Rhodhiss Manufacturing Co., and the E. A. Smith Manufacturing Co., of Rhodhiss, N. C.

Frank Page has succeeded J. R. Page as president of the Francis Cotton Mills, Biscoe, N. C.

J. P. Couch has accepted the position of overseer of weaving at the Aiken Manufacturing Co., Bath, S. C. He was formerly employed at the John E. Smith Mill, Thomson, Ga.

Joseph Herzfield has been appointed secretary and treasurer of the Lang Manufacturing Co., West Point, Ga.

T. J. Reynolds, formerly secretary and treasurer of the Montgomery Cordage Co., Montgomery, Ala., has been elected president of this company.

J. W. Kidd, formerly superintendent of the Rhodhiss Manufacturing Co., and the E. A. Smith Manufacturing Co., Rhodhiss, N. C., has accepted a similar position with the Thrift Manufacturing Co., Paw Creek, N. C.

Florence McCarthy, for the past ten years employed at the Merrick Division of the American Thread Company, Holyoke, Mass., and overseer of the shipping department for the past two years, has resigned.

T. H. Moore has been appointed superintendent of the Kosciusko Mills, Kosciusko, Miss.

DEATHS.

Jacob Hengeveld, for several years engaged in the silk manufacturing business, died June 26 at his home in Paterson, N. J., at the age of 45 years, of pneumonia. Twenty-eight years of his life he put in the silk business. Twelve years ago in Kutztown, Pa., he started the Hengeveld Silk Throwing Co. Then he went to Paterson, N. J., with the Hengeveld-Bohl Silk Co., silk throwsters, and he remained in the firm up to two years ago when he retired from the business. He was well known in Masonic circles. Mr. Hengeveld is survived by his widow and eight children.

Albert E. Jones died at his home in Uxbridge, Mass., at the age of 65 years. He had recently resigned the position of overseer of dyeing at the H. T. Murdock & Company's mill, Proctorsville, Vt., and was intending to spend his remaining days in Uxbridge and retire from active business. For a number of years Mr. Jones was overseer of dyeing in the Hecla Mill at Uxbridge. He also served as a member of the School Board and was a charter member of the Composite Club of Uxbridge and a member of the National Association of Wool and Worsted Overseers. Mr. Jones had been in his usual good health and attended the service on Sunday at the Unitarian Church. Early Monday morning he went to the center of the town. He later returned and mowed the lawn about his house. Shortly after 11 o'clock he complained to his wife of not feeling well. A doctor was then summoned but he died a few minutes after the arrival of the physician. He is survived by his wife, one son and a twin brother, A. E. Jones of Hillsboro, N. H.

Edward Cook died at his home in Fall River, Mass., at the age of 66 years. Mr. Cook was a native of Bolton, Eng., and came to this country twenty-one years ago. For a number of years Mr. Cook had been overseer of spinning at the Kerr Mill, American Thread Co., Fall River. He is survived by a widow, three sons, a daughter and a brother, Richard H. Cook, who is general superintendent of the Kerr Mill.

David Brayton, Jr., treasurer of the Durfee Mill, Fall River, Mass., died at his home in that city, July 5, at the age of 58 years. He received his early education in the schools at Fall River and afterwards studied at Williston Seminary, Easthampton, Mass. After graduating from college he took a position in the office of the Arnold Print Works, of which plant his father was president. He was a member of the First Congregational Church and gave generously to its support. Mr. Brayton was also vice-president of the First National Bank, a director of the B. M. C. Durfee Safe Deposit & Trust Co., and the Sagamore Manufacturing Co. of that city. Two brothers and one sister survive him.

Marcellus Gould, president and manager of the New Hampshire Spinning Mill, Penacook, N. H., died in that city after an illness of a few months. He was the son of Moses and Mary A. (Dodge) Gould and was born in Chelsea, Vt., December 20, 1845. In 1867 he was offered the position of overseer of carding at the Wauregan Co., Wauregan, Conn., where he remained for ten years. In 1881 he came to Manchester, N. H., and entered the employ of the Amoskeag Manufacturing Corporation where he was made superintendent of the carding in 1886. In 1899 Mr. Gould organized the New Hampshire Spinning Mill Corporation of Penacook. He was a thirty-second degree Mason, also an Odd Fellow and is survived by a wife and one daughter.

Henry G. Morey, a charter member of the National Association of Wool and Worsted Overseers, and secretary of the beneficiary department connected with the organization, died May 30 as he was returning with the Grand Army veterans after decorating the graves of departed brothers at Brooklyn, Conn. Mr. Morey had held prominent positions in woolen mills such as the Hoyle Bros., Millbury, Mass., Campbell & Elliott, Newcastle, Del., Damon Manufacturing Co., Concord, Mass., and the H. W. Johns-Manville Co., Brooklyn, N. Y. Some years ago he retired from active life and is survived by a wife, one daughter and two sons.

Thomas Pickup, senior partner of the firm of Pickup & Kean, Inc., dyers of cotton skein yarns, Allentown, Pa., died July 2, at his home in Allentown.

Henry Beatty, member of the firm of Fifer & Beatty, dealers in mill supplies, Kensington, Philadelphia, Pa., died at his home in Philadelphia recently. He is survived by his widow and several children.

Charles E. Stevens, of the firm of Charles A. Stevens & Co., Ware, Mass., manufacturers of woolen goods, died at his home in Ware at the age of 70 years. He had been troubled for some time with kidney affliction. Mr. Stevens was born in Ware, April 21, 1843 and in 1872 was admitted to partnership with his father in the flannel cloth manufacturing business. He held the office of president of the John Russell Cutlery Co. of Turner's Falls, Mass., and was a former director of the Turner's Falls Water Power Co., Turner's Falls, also a director of the Ware National Bank and the Ware River R. R. Co. In 1889 and 1890 he was a member of Massachusetts House of Representatives and for three years he served as a member of the Governor's Council.

Herbert R. Sayles died at his home in Uxbridge, Mass., at the age of 39 years. Mr. Sayles was born in Boston, the son of Mr. and Mrs. Herbert R. Sayles. His family moved to Uxbridge where he was educated in the high school and soon afterwards entered the employ of the Richard Sayles Woolen Co. After the death of his father he took the management of the mill and acted also as treasurer. Mr. Sayles had been in his usual good health, although he had been troubled somewhat in the past few years with malaria, which was not considered serious. He made regular visits to the center of the town and his death was wholly unexpected.

Albert H. Dennett died at his home in Salem, Mass., on June 6. He had been an invalid for a long time. He was born in Portsmouth, N. H., in 1845 and was a mill architect and engineer, in service at Manchester, N. H., and Lowell for many years. He designed and superintended the building of the Everett Mills in Lawrence. His wife survives him.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year. Communications for this department are invited. There is no charge made for printing notices of new mills, enlargements, improvements, etc.

COTTON.

Enlargements and Improvements.

*Alabama, Rock Mills. The Wehadkee Yarn Mills have just completed a new concrete dam, giving a fall of 31 feet, also a new concrete natatorium for employes, containing a large swimming pool, shower baths with hot and cold water, etc. They recently installed new cards and drawing frames and a new boiler, making the present equipment all new. Wm. S. Freeman, of West Point, Ga., is treasurer and buyer.

*Connecticut, Pine Meadow. The new addition to the mill of D. B. Smith & Son is nearing completion. It is of concrete construction, 30 by 40 feet, one story high, and when finished will be used for making cotton paper mill felts.

*Georgia, Columbus. In accordance with plans agreed upon at a meeting of the directors of the Eagle & Phenix Mills during the early part of the year, by which it was decided that auxiliary power should be provided to eliminate the necessity for closing down in time of low water in the Chattahoochee River, bids are being invited for the installation of electric power equipment. Besides this improvement, numerous other changes are being made in the Eagle & Phenix Mills. The new machinery equipment which it was reported was ordered in March is arriving and includes 3,000 spindles, 272 fancy and automatic looms, two dyeing machines, a warp tying machine and also preparatory machinery. The damage to No. 3 Mill caused by recent storms and which amounted to several thousand dollars, has been repaired. These improvements have all been noted previously, but in early reports it was not stated definitely whether the additional power to be added would be electric power or whether it would be supplied by extending the present steam power plant of the mills, which is used in some of the departments and for heating.

*Georgia, Hartwell. The directors of the Hartwell Mills, manufacturers of cotton sheetings, have authorized the management to double the plant and plans are now being made, but when the increase will be arranged has not been decided. The enlargement has been noted previously.

Georgia, New Holland. The Pacolet Mfg. Co. has completed the installation of 2,240 additional spindles at its local plant, and has also added 6,950 spindles to the equipment of its plant at Pacolet, S. C. The office of the company is at Spartanburg.

*Georgia, Trion. C. B. Caperton, assistant treasurer of the Trion Company, is quoted as authority for the statement that the addition to the company's plant reported about three months ago has been deferred, but that extensions to the power plant are under way, including new boilers, a new chimney, pump and generators. Previous reports have stated that about $300,000 was to be expended for improvements.

New York, Utica. Permit has been granted the Utica Steam & Mohawk Valley Cotton Mills for the building of an addition to its boiler house, to cost $5,000.

North Carolina, Greensboro. New machinery equipment for the Pomona Mills, Inc., which it was reported in April would be installed, has been received and the work of setting up the new machinery is progressing. The added equipment includes 5,000 spindles and a slasher, also speeders and spoolers. Several new tenement houses have been built for operatives to house the additional hands which will be employed.

*North Carolina, Lawndale. In addition to building a large dye house, noted recently, the Cleveland Mill & Power Co. will build an extension to the mill, 60 by 40 feet, two stories high, to provide a winding room in connection with the dye house. The dyeing is done in skeins and the product is then wound for skeins on cones, tubes, etc. The new dye house will not be as large as at first reported, the plans calling for a building 180 by 35 feet, one story high. The management hopes to complete the new dye house and mill extension by Oct. 1. This concern makes carpet warps, twines, wicks and clothes lines. An addition was recently built and equipped with twisting frames and ball winding machines.

*North Carolina, Lenoir. Repair work following the damage done to the plant of the Whitnel Cotton Mill Co. by the recent wind storm is going forward and will include an extension to the building to provide for a small increase in equipment.

*North Carolina, Randleman. As noted previously, the Deep River Mills are closed for thirty days to connect the new power plant. This new plant is equipped to develop 1,500 h. p. and will run the three mills. Less than two years ago the Deep River Mills, Inc., took over the Naomi Falls Mfg. Co. and the Randleman Mfg. Co., and since then a number of improvements have been made, including additions to all departments and the building of a new dye house. Cheviots, cotton plaids and seamless grain bags are manufactured on 18,800 ring spindles and 1,000 looms. The officers are J. C. Watkins, president and treasurer; R. P. Deal, manager; D. Sutcliffe, superintendent of No. 1 Mill, and C. G. Voss, superintendent of No. 2 Mill. The Hunter Mfg. & Com. Co. of New York and Greensboro are selling agents.

*North Carolina, Siler City. New spinning equipment recently ordered by the Hadley Peo-

ple's Mfg. Co. increases the number of spindles from 8,356 to 9,356. This increase of 1,000 spindles will necessitate the employment of additional operatives.

North Carolina, Statesville. Some new machinery equipment has been purchased by the Statesville Cotton Mills. T. D. Miller, the secretary and treasurer, buys the machinery equipment.

North Carolina, Thomasville. An increase will be made in the authorized capital stock of the Jewell Cotton Mills to $250,000. New cards, speeders and winding equipment are being installed.

*South Carolina, Anderson. The Conneross Yarn Mill have installed in their new addition only sufficient new machinery to manufacture from 1,000 to 1,500 lbs. of cotton mill waste daily, their idea being to install more machinery later on if this small department is successful. Two new sets of wool cards have been added.

*South Carolina, Chester. One hundred new looms and 2,560 additional spindles comprise the new equipment provided for by the addition to the plant of the Eureka Cotton Mills. Production of goods, wide print cloths, on this new machinery begins July 15.

South Carolina, Edgefield. A cotton oil mill here owned by the Beaver Dam Mills will be sold. It was formerly run in connection with the cotton mill.

South Carolina, Newry. An order for additional spinning frames has been placed by the Courtenay Mfg. Company. Print cloths are manufactured on present equipment of 25,000 ring spindles and 648 looms.

South Carolina, Spartanburg. It is reported that the Beaumont Mfg. Co., manufacturers of wide convertible goods, carpet warp and twines, are to erect a two-story brick addition at an expenditure of about $40,000. The company, of which D. L. Jennings is president and treasurer, has a present equipment of 35,540 spindles and 700 looms.

WOOLEN.

New Mills.

Maine, Pittsfield. It is reported that a new industry is to be established here in the form of a shoddy plant by Wm. M. McGilvery, for a number of years superintendent of the Waverly Woolen Co. at this place, and D. E. Cummings of Old Town. What is known as the Bryant mill property on Hunnewell Ave., formerly a woodworking plant, has been purchased and will be remodelled and equipped as a shoddy mill. It is said that the same will be ready for operation in about three months. The new concern will do business under the style of the McGilvery, Cummings Co.

*Massachusetts, Westboro. A building on Mill St. formerly occupied by a shoe manufacturing concern has been purchased by the Bay State Felt Co., recently reported incorporated. The company will occupy the three lower floors and will, it is understood, make felts for derby and soft hats. Sample work is being done and it is said that the plant will be operating in full before the end of the year.

Pennsylvania, Philadelphia. An application has been made for a charter for the Sykes & Geiger Company, with Warren Geiger, C. A. Sykes and Walter G. Sykes, as incorporators. This company will conduct the plant recently reported by us to be started up by Walter Sykes in this city some time during the coming fall. They have leased the building at Frankford Ave. and Van Dyke St., Frankford, formerly occupied as a dyeing establishment, which is now being put in condition for their purpose. The plant will be run on woolen and merino yarns spun under a new system, the equipment having been ordered from abroad.

*Pennsylvania, Philadelphia. The Klenk-Landis Co., recently reported incorporated with capital stock of $10,000, have commenced operations at Emerald and Adams Sts., where they are operating 3 sets of cards and 2,300 mule spindles on woolen and merino yarns, 8 to 40 cut, skeins and cops, which they are selling direct, and also doing commission work. The officers of the company are James Klenk, president, Lewis Klenk, treasurer, and William S. Landis, secretary and manager.

Enlargements and Improvements.

*Connecticut, Bridgeport. The new power house which is being built by the Salt's Textile Mfg. Co. is of steel, brick and concrete construction, 39 by 48 feet, with an extension 18 by 22 feet. A one-story brick building for sanitation, 10 by 52 feet, is also included in the work being done at this plant.

*Maine, Wilton. It is reported that most of the old looms that were in the old mill of the Wilton Woolen Co., which has been shut down for some time, have been sold, and that the others will be disposed of at once. It has been noted previously that new floors are to be laid in this building and larger windows cut in the walls and that on the completion of this work new looms are to be installed and the mill started up in the fall.

Massachusetts, Clinton. The Bigelow Carpet Company is securing estimates on the cost of the erection of a new 3-story brick mill, 133 by 77 feet, on the site of old buildings at its plant on Main St. The projected mill is designed for picking and carding.

Massachusetts, Farnumsville. Men in the employ of the Wuskanut Mill of S. Slater & Sons, Inc., are tearing up the floor in the old weave shop and laying a new flooring. Sections of the mill are running while this change is going on. Repairs are also to be made to the saw-tooth roof of the new weave shed. Up to last Saturday, the mill has been running overtime, and beginning next Monday, the plant will resume running either on full time or on an overtime schedule.

Massachusetts, Jefferson. Twenty new automatic looms have been received by the Jefferson Mfg. Company and will be installed during August. The automatic looms in the upper mill will also be moved to the lower mill. Employes will be given a week's vacation in August while this change is being made. Owing to the breaking of a crank pin on the engine on Monday the lower plant was shut down for several hours.

Massachusetts, Lowell. It is said to be the intention of the United States Worsted Company to make some changes in the Musketaquid Mills, particularly in the power department. A plan to install a larger steam engine and dynamo is now being considered. The Musketaquid Mills are equipped with water and steam power and in addition purchase electric power. With a larger engine and dynamo it will be possible to generate all the electric power required.

Massachusetts, Webster. An addition will be built to the plant of the Perry Yarn Mills if a site can be acquired at a moderate figure. The plant is rushed with work and finds it impossible to install the necessary additional machinery in the present mill. Henry E. Smith, president and treasurer, states that the mill is being run to capacity and is behind on orders. Eight sets of woolen machinery are now being operated in the space formerly occupied by 4 sets, and the mill is so crowded that a further installation of machinery is impossible. They are running three nights a week until ten o'clock, making a high quality of wool and merino yarns for knitting and weaving. Negotiations are being carried on with other towns that offer more advantages for expansion and unless means can be found for enlarging the plant in Webster, they may find it necessary to move to some other town and move their machinery and business there. Mr. Smith states further that they have in mind the doubling of their capacity.

Oregon, Eugene. Repairs and improvements have been begun at the Eugene Woolen Mill which will cost over $5,000 and will increase the capacity of the factory. Changes will include the construction of a new drying room and the purchase of a new wool dryer, a hydro extractor, a washing machine and an additional warping machine. At present the wool washing and drying is handled in an old fashioned manner and the change will make a great improvement in the method of handling the wool. The plant is being operated at its maximum capacity and the spinning department is running 24 hours a day. With this schedule, the concern is hardly able to keep up with orders. Blankets, flannels and robes are manufactured on 4 sets and 24 looms.

Pennsylvania, Philadelphia. Report has it that E. C. Beetem & Co., operating a plant at 2nd and Diamond Sts., where they are manufacturing rag and cottage carpets, will remove the plant at the expiration of their lease, which will be September 1st next, to a new building now being erected in Carlisle, Pa., which they hope to have completed by that time.

*Vermont, North Montpelier. The contractors have made good progress on the rebuilding of the plant of the Little Mfg. Co., and the mill is nearly finished and will soon be ready for machinery. The new mill is two stories high and will have a larger capacity than the old plant, giving employment to about fifty hands. The concern will, as formerly, make a specialty of white flannels, but will also manufacture colored woolen goods for children's garments. Fred and Walter Little are in charge.

Wisconsin, Baraboo. Advantage is being taken of favorable conditions for the building of a new dam of solid concrete for the Island Woolen Co. It is to be 16 feet wide at the base and from 16 1/2 to 22 feet high. The work is well under way.

*Wisconsin, West Bend. The increase being made by the West Bend Woolen Mills will make the plant a three-set mill with fourteen looms. This is an increase of nearly 100 per cent. Wool blankets, wool shirtings, and wool wadding and batting are manufactured. The paid-up capital stock is now $62,000. John Geib is president, superintendent and buyer, and C. A. Geib is treasurer.

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Mills Starting Up.

*Connecticut, Elmville. Reorganization of the Elmville Worsted Company has been completed and the mill has resumed manufacturing. H. B. Shaen is now president, treasurer and buyer. P. E. Meisner is superintendent.

Rhode Island, Thornton. Operations at the Victoria Mills of H. Hartley & Co., makers of worsted tops, where a strike has been in progress for the past month, were resumed with a full force on Monday morning and it is understood that the plant is to be run night and day.

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Mills Shutting Down.

Massachusetts, Hampden. The owners of the Hampden Woolen Company have shut down the plant as they were unable to make satisfactory terms for releasing the property. These men took over the old Scantic Mills, formerly operated by the E. E. Redden Company about a year ago and changed the name to the Hampden Woolen Company.

Pennsylvania, Landenburg. The Landenburg Worsted Mills, Ezra Lund, proprietor, are reported as to close indefinitely, owing to business conditions. It is said that Mr. Lund contemplates a trip to Australia to study the prospects in the woolen industry there.

KNIT.

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New Mills.

*Indiana, Fort Wayne. Ground has been broken on Runnion Ave. for a building which will be equipped to manufacture sweaters, jackets, athletic stockings, and similar goods. Initial equipment will include four knitting machines. George H. Butler, who is employed by the Wayne Knitting Mills, heads the new project and recently

organized a company under the name of the B. & B. Knitting Company with capital stock of $10,000 to carry on the business. Adam Baus, also employed by the Wayne Knitting Mills, is associated with Mr. Butler.

Massachusetts, Boston. A Mexican textile manufacturing concern is planning to equip a plant for making knitted goods, including hosiery, underwear and other lines, and has secured a room for this department which is 26 by 100 feet. They will need knitting machines, trimming and finishing machines, a hank mercerizing machine, a hank dyeing machine, a hank bleaching machine, in addition to auxiliary equipment. All first-class machinery, up-to-date in every respect, will be installed and will be driven by electric motors. They have good clear water from the town mains but they have not a steam plant. The electric current is 3 phase, 220 volts, 60 cycles. They would like complete estimates and details of equipment. Information should be sent to John Furnans, New Bedford, Mass.

Massachusetts, Franklin. Quarters have been leased on Fisher St. by W. F. Brown, of Lexington, Mass., formerly connected with the Contoocook Mills Corp., of Hillsboro, N. H., who will establish a knitting mill for the manufacture of a similar line of goods to the product of the Contoocook company, wool and merino hosiery and underwear. It is understood that machinery is to be installed at once, to employ about 20 hands at the start. Mr. Brown's son will be associated with him in the business.

Michigan, Grand Rapids. The Williams Glove & Gauntlet Company recently began the manufacture of astrachan cloth and other knitted fabrics in a plant at 249 Pearl St. The equipment includes 8 knitting machines and 12 sewing machines, piece dyeing department, steam and electric power equipment. Thirty-five to forty hands are employed. The men interested in the concern are W. J. Williams, George T. Williams, and George E. Bennett. Mr. Bennett is superintendent and George T. Williams attends to the buying. The output is sold by Francis H. Holmes, 254 Fourth Ave., New York

*New Jersey, Medford. Work has been started on the foundation for the hosiery mill to be erected for the Powell Knitting Company of Philadelphia, and the building will be rushed. When completed about October 1, it will be equipped to give employment to about 150 hands. For several weeks past the Powell Knitting Company has been operating a number of machines here as an experiment to test the conditions.

New York, Cambridge. A branch of the Superior Mfg. Company of Hoosick Falls, is to be established in Cambridge and a building has been leased for a term of years. The concern manufactures women's and children's cotton ribbed underwear, union suits and sweater coats, and has found difficulty in securing sufficient help in Hoosick Falls.

*North Carolina, Durham. The new knitting mill established by William J. Berry at Alston Ave. and Pettegrew St., in manufacturing men's and ladies' hosiery with 20 knitting machines, operated by electric power. Mr. Berry personally superintends the plant and does the buying.

*Oregon, Portland. The Nollan Knitting Co., recently reported incorporated with capital stock of $100,000, has begun the manufacture of knit goods at 212 1/2 First St., the product at present being woolen and worsted sweater coats, on an equipment of 15 knitting machines and 12 sewing machines operated by electric power, the output being sold direct. The company, of which Henry Nollan is president and treasurer and Hugo Nollan superintendent and buyer, is requesting estimates on a woolen and worsted spinning plant to cost from $25,000 to $50,000 and to include scouring and dyeing equipment for handling the wool from the raw state to the finished yarn, and also a building to house spinning equipment to produce from 3,000 to 5,000 pounds of yarn per week.

*Pennsylvania, Bethlehem. The Central Knitting Co., recently organized by Irvin J. Hunsicker and Edward S. Buckman, both of Allentown, will begin operations at 12th Ave. and Broad St., West Bethlehem, on July 7. The mill will give employment to 40 hands when fully equipped, operating 7 knitting machines and 30 sewing machines on children's undervests and misses' union suits. J. Fink Thompson is superintendent. Mr. Buckman attends to the buying.

Pennsylvania, Denver. John Gerhardt has started a small hosiery plant and is manufacturing 144-needle cotton half hose with an equipment of fifteen knitters. He is selling the product direct.

Pennsylvania, Philadelphia. Chas. LeFevre & Co., 257 Market St., who have been manufacturing a line of cut neckties, have recently placed an order for six knitting machines as the initial equipment of a plant being started up by them for the manufacture of high grade silk neckties.

*Pennsylvania, Reading. B. H. Spatz, previously reported as establishing a hosiery mill at 639 Garden St., has begun manufacturing cotton half hose, with 12 knitting machines, using 16s and 18s yarns, under the name of the B. H. Spatz Hosiery Mills. He expects to increase and add other lines.

Pennsylvania, Reamstown. A new knitting mill, with 15 knitters, has recently been started up here by Raymond F. Becker, who is manufacturing a line of 144-needle cotton half hose.

Pennsylvania, Philadelphia. The tenement mill used for textile purposes at Howard and Montgomery Ave., which was recently damaged by fire, is being overhauled and repaired, the contract having been given to a local builder who is going ahead with the work.

Pennsylvania, Philadelphia. Hodgson & Beatty have notified the textile trade that the partnership existing between them has been dissolved by mutual consent and that the business in the future will be carried on by Walter W. Hodgson. This concern makes a business of card stamping and repeating for all classes of fabrics, being located at 315 West Lehigh Ave.

Pennsylvania, Sinking Spring. The Model Underwear Co. has begun the manufacture of ladies' fine union suits on an equipment of 5 knitting and 8 sewing machines, operated by steam and electric power, using 30s single combed peeler yarns and selling through commission houses and direct. The company is composed of N. H. Fichthorn of Reading and E. F. Wentworth of Wyomissing, who has been connected with the Fehr Knitting Co. of West Reading since it started in business.

*Pennsylvania, Tamaqua. Space in a building at South Center St. has been leased by Charles H. Leaman and is being equipped with four knitting machines and six sewing machines to be operated by electric power on women's union suits. Manufacturing will be started next week. Mr. Leaman will do business under the name of The Leaman Knitting Mill.

Utah, Salt Lake City. The Lloyd Knitting Co. is reported incorporated with a capital stock of $25,000 and the following officers: Ezra T. Lloyd, president; G. H. Islaub, vice-president; J. Francis Lloyd, secretary; Jennie H. Lloyd, treasurer. It is said that the company will take over a plant at 30 Richards which has been operated as a branch of the Cache Knitting Works of Logan and will make a high grade of sweater coats and underwear. Mr. Lloyd and Mr. Islaub are said to have been identified with the pioneer knitting enterprises in this state.

*Wisconsin, Oconto. The report in last issue to the effect that the Marinette Knitting Mills of Marinette would establish a branch plant here in the building formerly known as the Turner Opera House, is confirmed by the company, who state that the plant will be in operation soon. As noted, about 100 hands will be employed here.

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Enlargements and Improvements.

Delaware, Wilmington. The Glen Hosiery Co. are reported in receipt of orders which will keep the plant running in full until the first of the year. A large addition is in process of construction. The company manufactures men's and women's seamless hosiery on an equipment at present of 225 latch needle knitting and 80 sewing machines.

Illinois, Rockford. Work on a new four-story building, 90 by 60 feet, for the Burson Knitting Co. will be started it is said as soon as the old dye house, which now occupies the proposed site, can be torn down. The new building will be of brick and will be ready for use in the fall. New cement piers have been placed under the engine house and two stories will also be added to that. The company has a present equipment of 1,400 knitting and 100 sewing machines, operating on ladies' cotton hosiery.

Michigan, Perry. Equipment to make lines of sweaters, auto hoods, and other fancy knit goods is to be installed by the Perry Glove & Mitten Company. The mill is closed for a month while extensive repairs are being made, including the laying of new floors.

*New Hampshire, Belmont. Preparations are being made by the Ipswich Mills to reestablish the dyeing and finishing departments at the local plant. Assurance has been given the company by the citizens that labor conditions will be satisfactory.

*New York, Brooklyn. An increase has been made by the Infant Wear Knitting Corporation by the addition of one twenty-section full fashioned machine to make infants' veils. They will use 1/24 and 2/50 cotton yarns, 1/40 worsted and 2/30 silk yarns on this new line. This concern has just increased the capital stock to $15,000. Hermocrates Parra is president, treasurer and buyer, and William Richardson is superintendent.

New York, Cohoes. The Electric Knitting Co., manufacturers of novelty knit goods of all kinds, are increasing the capacity of their plant by the installation of additional machinery.

New York, New Hartford. About August 1 the Olympian Knit Goods Company will begin the construction of an addition to its present plant to provide more space for manufacturing its lines of ladies' light weight underwear. The office of this concern is in Utica. E. L. Wells is president, D. L. Davies, treasurer, and Joseph C. Rahn, superintendent. Messrs. Davies and Rahn attend to the buying.

Ohio, Painesville. The Ohio Textile Company has increased its capital stock from $10,000 to $20,000. Recently the concern moved to larger quarters and installed two new knitting machines. Plans have been made to double the equipment within a short time. Men's union suits and two-piece underwear in cotton, worsted, linen and silk are manufactured and sold direct by mail. R. H. Lapham is president and W. C. Clother, treasurer and buyer.

North Carolina, Albemarle. Extensive improvements are being made by the Wiscassett Mills Company, manufacturers of women's seamless hosiery, children's hosiery, and cotton yarns. The smoke stack has been torn down and a new 200-foot stack is to be erected in its place.

*North Carolina, Enfield. Regarding the report that the Enfield Hosiery Mills Co., Inc., would establish a branch plant at Newport News, Va., the company states that this location has not been decided upon, but that a branch will be established somewhere, as it is impossible to obtain sufficient help for their increased business at Enfield. The main plant at this place will not be moved. The company is capitalized at $100,000, with R. H. Ricks, president, and Geo. T. Andrews, treasurer and general manager; men's and women's double knee and plain rib hosiery is the product.

*Ohio, Mentor. The increase in equipment at the Mentor Knitting Mills consists of 5 new knitting machines, and the company has also added 10 new sewing machines to the equipment of its branch finishing plant at Erie, Pa.

*Pennsylvania, Boyertown. The addition to the plant of G. W. Unger, on which work was started in April, has been completed, and the

equipment increased. Women's cotton ribbed underwear is manufactured.

Pennsylvania, Landingville. The Landing Knitting Mills, operating 8 knitters and 5 sewing machines on athletic shirts, ladies', misses' and children's vests and infants' wrappers, are having erected a large new brick building adjoining their present mill, in which, it is said, a number of additional machines will be installed for the purpose of increasing their output.

Pennsylvania, Philadelphia. The Alberta Knitting Mills, Lena and Armat Sts., Germantown, have purchased the entire equipment of the Carleton Mills Co., Inc., used in the manufacture of bathing suits and jerseys, and the latter company has discontinued that line.

Pennsylvania, Philadelphia. The Puritan Knitting Mills of Pennsylvania, operating 85 flat knitters and 28 sewing machines on sweater coats and shaker knit coats, at 313 Arch St., finding their present quarters too small, have in contemplation the erection of a new building in which to remove their plant. In the event of the deal going through they will have erected a building 75 by 200 feet, six stories in height.

Pennsylvania, Philadelphia. Louis Bry & Co., manufacturers of boucle cloths in the Hohlfeld Bldg., 9th and Allegheny Ave., for the purpose of enlarging their equipment, have recently purchased a number of machines in Europe which are now on their way to this country and will be installed and started up as soon as received.

*Pennsylvania, Schuylkill Haven. The boiler being installed by the S. Thomas Knitting Mill is of 100 h. p. They have also recently added new finishing machines and are preparing to double the capacity of the plant, as they report that their lines for the coming season have been very well received by the trade. They also anticipate adding a dyeing and bleaching department. Children's vests, pants and union suits are manufactured.

Pennsylvania, York. A new mill is to be built by the Acme Hosiery Company at 580 West Philadelphia St. where land has been purchased. The new mill will be of brick, of modern mill construction, and will give a large increase over the present building. Seamless cotton half hose, 144-needle goods, is manufactured on 43 latch needle knitting machines, 13 ribbers and 8 loopers. George W. Rennoll is president and George J. Sowers, treasurer and superintendent.

*Rhode Island, Providence. Four new machines have been ordered by the Providence Silk Hosiery Co. and are expected very shortly. As reported a week ago, the capital stock has been increased from $50,000 to $100,000. This increase is to provide for an enlargement of the business, as it is planned to make increases from time to time. Men's and women's full fashioned silk hosiery is manufactured on present equipment of 18 full fashion knitting and 12 sewing machines. J. T. Johnson is president; A. P. Weightman, treasurer, and John A. Staton, superintendent.

*Tennessee, Lawrenceburg. The May Hosiery Mills have moved the equipment in their branch mill established here a short time ago to the new factory just completed. The new mill is a brick structure, 80 by 180 feet, and was built by popular subscription of the citizens of the town. It will be deeded to the May Hosiery Mills when their pay roll here reaches $40,000.

*Tennessee, Rockwood. The Rockwood Mills are now operating their knitting machinery in their new mill building, and the paper box department and the mending room are also installed in the lower floor of the same building. The old knitting room will be changed into a dye house for aniline, sulphur and developed blacks, the present dye house being used for bleach, tan and colors. Children's hosiery is manufactured on a present equipment of 174 knitting machines, 314 ribbers and 56 loopers. J. F. Tarwater is president of the company, James A. Ervin, treasurer, and Garnett Andrews, general manager.

Wisconsin, Beloit. Work in the knitting department of the Racine Feet Knitting Co. has been suspended for about a week, to allow for improvements which will about double the capacity of the power plant. The company, of which John W. Amend is general manager, makes "Racine Feet" and seamless hosiery, and is reported as enjoying a very good business.

Wisconsin, Green Bay. Following the purchase of the equipment of the Imperial Knitting Mill of Appleton last spring, as noted, the Inland Knitting Works have made other additions and improvements, providing for an increase in output, as well as a higher grade of product. Seamless hosiery, lumbermen's socks, sweater coats, etc., are manufactured.

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Mills Starting Up.

New York, Cohoes. The plant of the Parsons Mfg. Co. on Remsen St., which has been idle for some time, has been leased by James H. Shine, president of the Hope Knitting Co., who has prepared the mill for immediate operation. The plant has an equipment of 6 sets, 48 cylinders, 15 ribbers and 80 sewing machines for the manufacture of men's and women's flat underwear. It is said that many of the employes of the Parsons company will be given their old positions, with John H. Shine in charge and with sufficient orders ahead to insure the running of the plant on full time.

*Ohio, Tippecanoe City. The Superior Underwear Company of Piqua, manufacturers of union suits for men and boys, will operate the old plant of the Tippecanoe Underwear Company, recently purchased, as noted, as a branch of the Superior Underwear Company at Piqua, O. They contemplate making the Tippecanoe mill a finishing plant, knitting all of their cloth at principal plant at Piqua. They are not prepared to state the number of sewing machines that will be operated at Tippecanoe City as this will be largely governed by the labor conditions. J. P. Spiker is president and J. L. Black, secretary and treasurer. The Tippecanoe Underwear Company was in financial difficulties some time ago and the plant has been shut down.

New Publications

(Any work noticed under this head can be obtained through the office of this journal.)

Silk Manufacturing and Its Problems, by James Chittick; 432 pages, 5 1/2 by 9; published by the author, New York. Price $3.

The greater part of the contents of this volume consists of articles originally published in "Silk." These have been carefully revised and new matter added, the whole making a volume that is specially adapted for the requirements, not only of silk manufacturers, but of textile manufacturers and merchants generally. The following abstract of the table of contents shows the various subjects treated in addition to the tables: Selecting a Location for a Mill; Purchasing Raw Silks for a Mill, The Characteristics of Japanese Raw Silks; Adulteration of Silk Goods, Analysis of Percentages and Cost of Weightings; Cotton Yarns and Their Use in Silk Manufacture; Should a Mill do its Own Throwing, Silk Printing, Finishing and Dyeing; Power Transmission in Textile Mills; Humidification in Textile Mills; The Testing, or Conditioning of Silk and Other Fibers; The Costing of Broad Silks and Ribbons; Cost Sheets and Tables of Weights; Verification of Costs; Analysis of the Relative Costs of Plain and Fancy Goods; The Relations between Mills and their Commission Houses; The Relations between Mills and their Salesmen; Regarding the Cost of Sample Collections; Changes in Merchandising Methods; Specialization in Production; Advertised Fabrics; The Question of Making Goods for Stock; Regarding Auction Sales; Finding Foreign Markets for Silks; Cotton Mill Competition; Directing the Production of a Textile Mill; Imperfections in Manufactured Goods; Claims, Cancellations and Returns; The Question of Prices to Use in Stock Taking; What to Figure for Depreciation of Plant; Capital Required in Silk Manufacturing; The Curtailment of Mill Credits; Plan for the Creation of a Great Silk Corporation; The Denier System of Silk Measure and its Origin; Efficiency Standards in Manufacturing.

Raw Silk, by Leo Duran; 179 pages, 4 1/2 by 7; Silk Publishing Co., New York. Price $2.50.

This work has been prepared for the buyers of raw silk and is a study of raw silk production and filatures in Europe and Asia. It gives much useful information regarding the silk trade. Following is an abstract of the table of contents: The Mulberry and the Butterfly; Scientific Life of the Silkworm; Domestic and Wild Cocoons; Growth and Development of the Modern Filature; Conditioning, Testing and Boiling Off; Raw Silk Industry of Italy; Lyons, the City of Silks; Japanese Filatures; The Silk Exchange; Silk Waste; The Crop and How it is Manipulated; Inspection; Private Chops; How to Improve Japanese Raw Silks; The Shanghai Market; Raw Silk in the Canton Province; Improving the Raw Silk Business in New York; Quilling and Coning; Raw Silks Used in New York; Asiatic Silks, Japan Filatures, Japan Kakeda and Douppioni; China Steam Filatures; Tsatlee Crossreels, Tussahs, Canton Silks; Raw and Waste Silk Exporters in the Far East.

The Blue Book Textile Directory; Davison Publishing Co., 407 Broadway, New York. Price $4.00.

The usual attractive features are found in this publication. It gives under various classifications reports of the textile manufacturing establishments in the United States and Canada, also commission merchants, yarn dealers, cotton, wool, hair and waste dealers, etc. The book is well printed and bound and gives evidence of the usual careful preparation.

How to Build, Equip and Operate a Cotton Mill in the United States; 766 pages, 6 by 8 1/2; Frank P. Bennett & Co., Boston, Mass. Price $3.

This is a reprint of articles published in the American Wool and Cotton Reporter. The first section deals with mill buildings and power plants. The second part relates to the management of mill, taking up in their order the various processes of manufacturing. The third part relates to bleaching, dyeing, mercerizing and finishing. Part four is devoted to cost systems. An index enables the reader to refer quickly to any subject desired. The book will be found of value to both mill owners and operatives.

Dyeing Apparatus (Apparatfaeberei), by E. J. Heuser; 301 pages, 6 by 9; Julius Springer, Berlin, Germany. Price $3.

This book is devoted to a description of the various machines used in dyeing and bleaching cotton and wool. Incidentally it gives much valuable information regarding the different processes of dyeing and bleaching. The following is an abstract of the table of contents: 1, bleaching machines; 2, dyeing machines; 3, mechanical systems and packing machines; 4, packing machines; 5, spindle machines; 6, special apparatus; 7, dyeing methods for different dyestuffs; 8, basic dyes; 9, substantive dyes; 10, sulphur dyes; 11, Turkey red; 12, Para red; 13, dyeing wool in machines; 14, the pack system; 15, the spindle system; 16, acid dyes; 17, developed colors; 18, vat dyes; 19, dyeing apparatus. The text is in German. The work contains many excellent illustrations of the different machines.

Washing, Bleaching and Finishing Materials (Wasch, Bleich und Appreturmittel), by Prof. H. Walland; 326 pages, 6 by 9; Julius Springer, Berlin, Germany. Price $3.

This is a condensed account of the different materials used in washing, bleaching and finishing textile materials. Following is an abstract of the table of contents: physics and chemistry, water acids, bases, alkaline salts, solvents, bleaching materials, chlorine and hypochlorite, sulphur dioxide and sulphites, acids in bleaching, fats, waxes, paraffine, fatty acids, glycerine, soaps, soap preparations, wool oils, vegetable washing materials, scouring preparations, cellulose, starch, flour, dextrine, sugar, molasses, gums, weighting materials, waterproofing materials, fireproofing ma-

terials, blueing, dyes for sizing and weighting materials, antiseptic materials, finishing yarns and fabrics made of normal fibers, sizing, testing fastness of color on the fiber. The text of this useful work is in German.

BUSINESS LITERATURE

Worthington Volute Centrifugal Pumps; Henry R. Worthington, 115 Broadway, New York.

A 62-page pamphlet has just been issued by the International Pump Co. describing and illustrating the different types of Volute centrifugal pumps. This pump derives its name from the form of casing, which is similar in shape to the involute curve.

Industrial Notes

ANNOUNCEMENT BY DANKER & MARSTON

We beg to announce that the partnership lately existing between the undersigned Daniel J. Danker and John P. Marston carrying on business at Boston, Mass., under the firm name of Danker & Marston was on the first day of July, 1913, dissolved by mutual consent and that the business in future will be carried on by the said John P. Marston. We take this opportunity to thank our many customers for their past business and courtesies and ask a continuance of same for the future.

Daniel J. Danker,
John P. Marston.

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In announcing my retirement from the firm of Danker & Marston, that I may give my entire attention to other interests, I take this opportunity to thank the Textile trade for past courtesies and ask for a continuance of same to Mr. John P. Marston, who succeeds to the business.

Daniel J. Danker.

July 1st, 1913.

A CANADIAN BRANCH

The B. F. Sturtevant Company of Canada, Limited, has arranged for a plant in Galt, Ont. From this plant the company will handle all business in Canada, and also export to England, Australia and other foreign countries. The property in question is such that the manufacturing and assembling of the more important lines as manufactured by the B. F. Sturtevant Company of Boston, can be started almost immediately. Arrangements have been made to provide for a growth up to ten acres of plant, as arranging for this plant and incorporating in Canada, means a development of the blower business in Canada by this company on the same large scale as has been accomplished in the United States, by the B. F. Sturtevant Company of Boston. Salesmen are already located to cover Montreal, Toronto and Vancouver sections, and offices will soon be established in each principal city of Canada.

The manufacturing, engineering and sales will be handled by men trained by the B. F. Sturtevant Company of Boston, and the general policy of that company of manufacturing high grade material for the best class of trade will be carried out. Some of the more important apparatus which will be built are fans and blowers, planing mill exhausters, propeller fans, heating and ventilating apparatus, fuel economizers, mechanical draft, steam turbines, vertical engines, generating sets, and stokers.

THE CORN PRODUCTS REFINING COMPANY

G. M. Mac Nider, formerly connected with the Division of Chemistry of the North Carolina Department of Agriculture, and who for several years has been making investigations on the uses of commercial starches in the cotton industry, is now connected with The Corn Products Refining Co., 17 Battery Place, New York, in charge of the mill starch department.

This department is now in a position to solve the various problems which come up in the sizing and finishing of cotton goods. At any time they need the services of an expert in this line, patrons of the company are privileged to call on Mr. Mac Nider to help them.

THE ILLUMINATING ENGINEERING SOCIETY

The convention of the Illuminating Engineering Society will be held at the Hotel Schealen, Pittsburg, Pa., on September 22-26.

The program as outlined at the present time covers an exceedingly interesting set of papers on the various subjects pertaining to illumination. In addition to the technical sessions of the Society, the local committee has arranged a number of features for the entertainment of the members and ladies who may be present. These cover golf, tennis, base ball games, automobile rides, theatre and card parties, and conclude with a banquet.

Inspection trips have been arranged to several industrial plants including the Westinghouse Electric & Mfg. Company, Macbeth Evans Glass Company and the Canegie Steel Company; also a luncheon for the ladies at the H. J. Heinz Company's works.

The papers as scheduled at this time include among a number of other subjects, the Quartz Light, Fontune, and Neon Tube, Church, Factory, Store, Hospital and Street Car Lighting, The present commercial development in several forms of lighting, errors in Photometric measurement, and the history of artificial lighting. In addition to these, a number of others on equally interesting subjects will be presented by authors well known to the engineering profession in illuminating as well as other fields.

The development of the new flame carbon arc lamp will also be discussed by representatives of the manufacturing concerns.

An interesting feature in connection with the technical sessions will be the holding of symposiums on the various general subjects to be led by those particularly well posted on the different subjects. These meetings will afford an oppor-

tunity for free and open discussion that it probably would not be possible to obtain in a more formal meeting.

THE PEROXIDE BLEACH

The Roessler & Hasslacher Chemical Co., New York, invite bleachers to send samples to them to be bleached in order to show the results obtained with peroxide process. The Company states that bleachers will be surprised to see that the best white can be duplicated at the same cost as the ordinary bleach and sometimes for less. It is stated that the peroxide bleach is fast while the ordinary bleach is liable to turn yellow. The fiber is not tendered and the softness and elasticity are retained.

SOLUBLE SOFTENING OIL

In preparing their soluble softening oil The Arabol Mfg. Co., 100 William St., New York City, have succeeded in manufacturing a compound of great uniformity all the year around. It will not sour in the hottest weather. Those who use it prefer it to tallow and other oils and greases because it is more efficient and easier to handle. Being neutral it is most suitable for closely woven goods. It gives a smooth finish to the warps while the threads divide well in the lease rods and the cylinder of the slasher remains clean.

VARIABLE SPEED PAPER MILL ENGINE

The American Engine Co., of Bound Brook, N. J., has recently received an order from the Minnesota & Ontario Power Co., of Minneapolis, Minn., for two 500 h. p. four-cylinder variable speed paper mill engines. These engines are to be installed in the new mill of the above company, located on the Canadian side of the Rainy River of International Falls. These engines are designed for a wide range of speed and equipped with an improved governing mechanism for giving close regulation of speed and, therefore, even thickness of paper. The engines are duplicates of an engine now being built for the Donnacona Paper Co., of Donnacona, near Quebec.

THE MANAGER OF GOULDS CENTRIFUGAL PUMP DEPARTMENT

The Goulds Manufacturing Company, Seneca Falls, N. Y., announce the recent appointment of F. Z. Nedden of London, Eng., as engineer in charge of the centrifugal pump department. Mr. Nedden's technical education was obtained at the Technical University of Berlin at Charlottenburg, where he graduated with high honors. His early practical training was obtained in the shops of the Berliner Maschinenbau A. G. vormals L. Schwartzkopff in Berlin and Wildau, from 1899 to 1906. From 1906 to 1908 he was assistant professor on gas and rotary engines and machines at the Technical University, Aix-la-Chapelle. In 1908 he traveled through Europe by order of the Senate of the Technical University of Berlin, investigating problems in connection with the manufacture and application of high lift turbo machines. In 1908 he joined the machine and pump factory of Messrs. Weise & Monski, Halle, Germany, and developed their line of high lift turbine pumps. In 1910 he was transferred to London and from that period until 1913 he developed their English and colonial business. During 1912 he traveled in South Africa and Canada in the interests of this company.

Mr. Nedden has recently been making an extensive trip through the United States studying the technical and economical conditions of the market for centrifugal and turbine pumps and has now taken up his duties with The Goulds Manufacturing Company at Seneca Falls. He is the author of German text books for engineering students, which have been translated in English under the auspices of the Institute of Civil Engineers. He is also author of numerous articles in the technical press. He is a member of the Verein Deutsches Ingenieure, South Wales Institute of Mining and Mechanical Engineers and the South African Institute of Engineers.

OPENS NEW BRANCH

In accordance with its long established policy of business expansion, the H. W. Johns-Manville Co. has recently opened a branch office at Charlotte, N. C. The new office, which is located in the Commercial Bank Bldg., is in charge of E. U. Heslop, who is assisted in covering the western section of North Carolina by P. J. McCusker and Paul W. Whitlock.

THE AMERICAN PULLEY CO.'S NEW YORK STORE

The American Pulley Company has moved its New York branch from 203 Lafayette St. into more commodious quarters at the corner of Grand and Greene Sts.

At the new address is carried a complete stock of "American" belt pulleys. Orders will be received for reels, spools, beams, sash pulleys and pressed steel shapes.

THE CATSKILL CORLISS ENGINE

The Catskill Foundry & Machine Works, of Catskill, N. Y., recently purchased from the owners the patterns, blue prints and drawings, also the stock of manufactured parts for the Corliss engines put out by the Fishkill Landing Machine Co., of Fishkill-on-Hudson, N. Y., and succeed to the business of making and furnishing repairs for this well known power line.

George B. Van Tine, former superintendent for the Fishkill concern, goes with the Catskill Foundry & Machine Works and will give his personal attention to this branch of work.

DRYING FORMS FOR HOSIERY

The Paramount Metal Form Drying Co., located at Beaver Dam, Wis., have increased their capital stock from $10,000 to $20,000, and secured much larger space for the rapidly increasing business of their metal drying forms for hosiery.

COURT OF APPEALS DECISION

Rockford, June 26, 1913.

The following notice has been sent to the trade:

On June 11th the Court of Appeals of the 4th Circuit rendered their decision affirming the decision of the United States District Court of North Carolina against the Byrd Mfg. Co. holding our patents valid and the Byrd knotter an infringement.

This decision is final within the jurisdiction of the Court and although there is still an appeal pending in New England there is no reason to suppose there will be a different decision there than that rendered by three United States Courts that have already heard the case.

We again call attention to the fact that users of an infringing article are equally liable with the manufacturer and seller.

Very truly yours,
Barber-Colman Company.

THE LATEST TYPE OF TERRY TURBO-ALTERNATOR

The Terry Steam Turbine Co., Hartford, Conn., who build turbo-generator sets from 5 to 500 k. w., either direct or alternating current, have recently put on the market a new type of Terry 3600 r. p. m. turbo-alternator called the "Terry type C. H. S."

ASBESTOS ROOF STOPS CONFLAGRATION

The ability of asbestos roofing to resist fire and check the progress of a blaze was again demonstrated by a fire which broke out in one of the sheds of the Export Lumber Company, Charlestown, Mass. The blaze quickly gathered headway and in a very short time reached such proportions that the fire companies were powerless to check it.

The fire burned its way from the sheds of the Export Lumber Company to a large storehouse owned by the same concern. This storehouse was covered with asbestos roofing. Owing to the fact that falling embers and sparks had no effect on this roofing the fire department was enabled to concentrate its energies on the advancing wall of flame with the result that the fire was gradually brought under control.

The roofing that so effectively put a stop to this conflagration is known to the trade as J-M Asbestos Roofing. It is manufactured by the H. W. Johns-Manville Co., of New York. The construction of this roofing is unique, as it is composed of a felt made from asbestos rock reduced to fibers. Layers of this stone felt are cemented together with Trinidad Lake asphalt, the whole forming a roofing that is literally a sheet of flexible stone.

FIRE HOSE

W. S. Harley has been appointed by the Eureka Fire Hose Mfg. Co. to be their agent for fire department hose in the States of Montana, Oregon, Idaho and Washington with offices in the Paulsen Bldg., Spokane, Wash.

POSITIONS FOR GRADUATES

Graduates of the textile department at the A. & M. College, West Raleigh, N. C., have been appointed to the following positions during the past year: W. S. Dean, Assistant Cotton Technologist, Department of Agriculture, Washington, D. C.; L. R. Gilbert, Superintendent Caraleigh Cotton Mills, Raleigh, N. C.; J. S. Stroud, Superintendent Lauderdale Mills, Meridian, Miss.; G. G. Simpson, Assistant Secretary Great Falls Mfg. Co., Rockingham, N. C.; W. M. Millner, Assistant Superintendent, Holt-Granite Mills, Haw River, N. C.; M. Hendrick, Overseer Spinning, Cliffside Mills, Cliffside, N. C.; G. G. Allen, Overseer Carding, Gibson Mfg. Co., Concord, N. C.; J. C. Cosby, Designer Brogon Mills, Anderson, S. C.; C. J. Hall, Cost Accountant, New York Mills, New York.

PARTNERSHIP DISSOLVED

Notice is hereby given that the partnership existing between Walter W. Hodgson and William E. Beatty, engaged in the business of card stamping and repeating, at 315 West Lehigh Ave., under the name of Hodgson & Beatty, has been dissolved by mutual consent, William E. Beatty withdrawing therefrom. The business will be continued at the same place by Walter W. Hodgson, who will pay all bills and accounts due by said partnership and to whom all bills and accounts due said partnership must be paid.

HORSES VERSUS MOTOR TRUCKS

"The frequent statement that a motor truck must be kept moving to prove its superior efficiency over a horse is but half truth and particularly misleading because it inspires the false inference that the contrary is true of the horse," says H. B. Pruden of the Kissel Kar. On reflection it must be perfectly obvious that the value of animal power is more dependent upon motion than is mechanical power. A horse in his stable or the truck in its garage is worse than useless, because neither makes any return on the investment; but the idle truck is much less expensive than the idle horse.

Supposing a delivery equipment, consisting of two horses and wagons and one Kissel Kar 1,500 pound truck, were obliged to remain idle for a period of six months. Interest on the investment on two single outfits costing $1,120, at 6 per cent. per annum would amount in the six months to $33.60, and on a $1,650 truck to $49.50. Depreciation of the horses at 10 per cent. adds $25, and feeding and grooming them at $2.00 a day brings the expense for maintaining Messrs. Dobbin for six months up to $423.60, as against $49.50 for the truck. So when you hear the assertion made that a truck's efficiency depends upon keeping it moving, do not jump to the conclusion that it is more expensive standing still than a horse, because it is not. It is less expensive and it is from 5 to 8 times more efficient than the horse when moving.

AN OCTOGENARIAN WOOLEN MANUFACTURER

On August 1 Robert Bleakie was eighty years of age and a number of his friends celebrated the event by a luncheon at the Parker House, Boston, Mass., at which Mr. Bleakie was the guest of honor. Those present included representatives of the woolen industry, the wool trade, clothing manufacturing and the textile trade press, who gave expression to their respect and friendship for their venerable guest in well-chosen remarks. Although eighty years of age and probably the oldest woolen manufacturer in the United States, Mr. Bleakie is far from being on the retired list. Every week sees him journeying from Boston to his mills at Sabattus, Me., or to the New York market, taking active part in the manufacturing and sale of his goods. We extend our congratulations to him and hope that he may remain for many years to come an example of youth in old age.

BUSINESS ACTIVITY

With reference to the sale of some manufacturing plants J. E. Conant & Co., the auctioneers of Lowell, Mass., have sent out an interesting notice. They report that each sale was largely attended and that the demand for the machine tools, general machinery, mechanical equipment, and other personal property were the equal of the demand at any sale—possibly with a single exception—of which they have knowledge within the past few years There was not an omen at any one of the sales that did not reflect good business conditions, a wide awake attendance, and an enthusiastic demand for the property.

UNIT COSTS OF COTTON STOREHOUSES

The unit costs of five cotton storehouses designed by Lockwood, Greene & Co., architects and engineers for industrial plants, Boston, for different textile manufacturers, are as follows:

No.	Construction	Cost per sq. ft.	Per cubic ft.	Per Bale
1	Mill construction with corridors of concrete	63.5c	6.8c	$5.68
2	Mill construction.....	62.2c	6.56c	6.04
3	Mill construction.....	67.4c	8.0c	6.65
4	Mill construction.....	80.8c	8.8c	6.84
5	Reinforced concrete..	$1.034	12.5c	10.58

In all of these storehouses about 8 1/3 sq. ft. is allowed per bale of cotton.

COTTON INDUSTRY IN SOUTHERN INDIA

Consul Henry D. Baker in Daily Consular and Trade Reports

The largest cotton mills in southern India are the Buckingham and Carnatic mills in Madras, which not only do weaving but dyeing and bleaching as well. Each of these mills employs about 5,000 people daily, whose individual wages have increased from 50 to 80 per cent during the past 20 years. Each operative is credited on the books with a gratuity of 5 per cent of his monthly wage and at the end of every half year in which the mill has worked to a reasonable profit a similar amount is added, the whole bearing interest at 4 per cent per annum. Each employee must serve ten years before he can draw upon this fund, but payments are made in case of injury or death. The success of this scheme has been most marked, and no strikes have taken place among the workmen since its introduction.

HAND-LOOM WEAVING ENCOURAGED

It is said that not only have the earnings of the hand-loom industry increased about 33 per cent since the introduction of the fly-shuttle slays, but there is now an increased demand for the finer products of this industry. This is borne out by the marked increase in the number of hand-loom weavers in such centers of fine weaving as Kumbakonam and Madura. In the former town the increase since 1900 has been from 465 to 1,824, and in the latter from 9,353 to 15,117. In Madura, which is one of the leading Indian centers of the dye trade, it is interesting to note that this industry has developed spontaneosly with the weaving industry. The dye trade of this city now deals with 2,000 bales of cotton in a month.

WAGES, HUMIDIFICATION, JAPANESE COMPETITION

In visiting the cotton mills at Bangalore it was noticeable that a great part of the work was performed by children of both sexes who do not receive over 5 cents per day. The hot climate of southern India tends to make the atmosphere of the mills here extremely oppressive, but in the construction of new mills a great deal of humane attention is now paid to making them more spacious and better ventilated and to cooling the air with fans and machines for spraying light jets of water. Practically all the machinery of the south Indian mills is of English manufacture, except electrical equipment, which is from the United States.

In the particular class of goods turned out by the south Indian mills Japanese competition seems to be more feared than that from the United Kingdom, while that from the United States does not seem to be an item for consideration. As the total imports of cotton goods into this section of India now represent as much as 34 per cent. of the total value of imports, it would seem obvious that with the enormous home market of over 70,000,000 people, the local mills have a great field before them for catering to the local demand at the expense of countries now making heavy exports here, of yarns and piece goods.

NEW GENERAL SALES MANAGER

Harry O. Latham of the Latham Machinery Co. of New York and Chicago has been appointed General Sales Manager with headquarters at Chicago, B. H. Wallace succeeding him at manager of the New York office.

Although Mr. Latham expects to spend considerable time in the East he wishes to thank his many friends in the territory he has just left for their many kindnesses.

The Tremont & Suffolk Mills, Lowell, Mass., are installing three additional 75 h. p. motors and switches purchased from the General Electric Company.

Recent Textile Patents

BOBBIN-CLEANER. 1,067,614. William Lonzo, Fitchburg, Mass.

CLOTH CUTTING Machine. 1,066,304. Charles F. Mitchell, Manchester, Eng.

CLOTH-PILING Machine. 1,067,379. Morris L. Shapera, Chicago, Ill.

CLOTH, Making Rivet. 1,066,439. Jerome T. Ruthledge, Millbury, Mass.

DYEING MACHINE. 1,067,132. Jesse M. Payne, Summerville, Ala.

DYEING, Process of. 1,067,380. James H. Skitt, Philadelphia, Pa.

ELASTIC CORD or Strand. 1,066,759. Meyer E. Schloss, New York.

GREASE and Similar Matter from Wool, Skins, Textiles and Other Materials. Extraction of. 1,067,357. Charles R. Mayo, London, Eng.

HEDDLE MECHANISM. 1,067,538. Pierre Mollon, Isere, France.

KNITTING MACHINE, Circular. 1,066,734. Edward E. Kilbourn, New Brunswick, N. J.

KNITTING MACHINE Thread Cutter and Clamp. 1,066,234. Albert E. Stewart, Franklin, N. H.

KNITTING MACHINES, Evener for Spring-Needle. 1,066,367. Harry F. Berry, Norristown, Pa.

KNITTING MACHINES, Pattern Mechanism for. 1,065,487. Frank B. Wildman, Norristown, Pa.

LACE MACHINE. 1,066,789. Joseph H. Bromley, Philadelphia, Pa.

LOOM. 1,065,555. Edward Schweser, Paterson, N. J.

LOOM. 1,065,766. Louis A. Aumann, Chicopee, Mass.

LOOM for Weaving Knotted Fabrics. 1,067,205. Thomas P. Walsh, Worcester, Mass.

LOOM REED. 1,067,619. Carl Moriggl, Arbon, Switzerland.

LOOM STOP Motion. 1,067,611. Arthur Kean, Boston, Mass.

LOOM SHUTTLES, Guide for. 1,066,824. Joseph N. Belisle, Worcester, Mass.

LOOM WARP Stop Motion. 1,067,063. John Regan, New Bedford, Mass.

LOOMS, Batten Structure for Narrow-Ware. 1,066,771. Adolph Widmer, Paterson, N. J.

LACES, Manufacture of. 1,067,324. John E. Dudson, River Point, R. I.

PILE FABRICS During the Cutting of the Pile Thereof, Beaming or Mounting Weft. 1,066,950. George Roger, Warrington, Eng.

SHUTTLE. 1,065,592. Jean B. Daudelin, Fall River, Mass.

SPINDLE LUBRICATOR. 1,065,781. David A. Corrie, Vincennes, Ind.

SHUTTLE-THREADER. 1,067,247. George H. Hull, Cranston, R. I.

SPINNING-FRAME Doffer. 1,067,192. Burt A. Peterson, Rockford, Ill.

SPINNING MACHINE Clearer. 1,065,687. John Jackson, Pawtucket, R. I.

THREAD COP. 1,066,466. Arthur N. Chartier, Dorchester, Mass.

THREAD CUTTING Device. 1,066,862. John J. Sullivan, Ipswich, Mass.

YARN CARRIER, Tuft. 1,065,871. George F. Hutchins, Worcester, Mass.

WARP STOP Motion, Electric. 1,065,937. John Hancq, Jamestown, N. Y.

WASHING FIBROUS Substances, Apparatus for. 1,065,947. Walter R. Kay, Cottingley, Eng.

WEAVING. 1,066,689. Matthew J. Whittall, Worcester, Mass.

WINDING MACHINE. 1,067,235. William J. Barrett, Brooklyn, N. Y.

WINDING MACHINE for Artificial Threads. 1,067,534. Jean Manquat, Villeurbanne, France.

WINDING MACHINE, Thread. 1,067,574. George E. Allen, Philadelphia, Pa.

RECENT TEXTILE TRADE-MARKS REGISTERED

41,731. Cotton piece goods. Mark: Press Proof. Owner: Narragansett Finishing Co., Cranston, R. I.

68,307. Knitting hosiery, shirts, etc. Mark: St. L. Mo. Owner: Jacob Frank Mercantile Co., St. Louis, Mo.

69,832. Knitted underwear. Mark: Swissam. Owner: Swiss American Knitting Mills, Grand Rapids, Mich.

69,895. Cotton and woolen piece goods. Mark: Panazone. Owner: Haley Mills, South Hadley Falls, Mass.

70,406. Knit underwear. Mark: Pioneer. Owner: Norwich Knitting Co., Norwich, N. Y.

70,726. Hosiery. Mark: Theta. Owner: I. & R. Morley, London, Eng.

69,153. Wool, worsted and hair piece materials. Mark Kremlaine. Owner: Thomas Campbell Cullen, Bradford, Eng.

69,149. Imitation fur. Mark: Philip Brous Co., New York.

69,891. Hosiery. Mark: Indestructoe. Owner: Des Moines, Ia.

70,400. Hosiery. Mark: Common Sense. Owner: Common Sense Suspender Co., Norristown, N. J.

70,427. Hosiery. Mark: Giant. Owner: Sacks & Levy, New York.

70,578. Hosiery and underwear. Mark: Ahtab Owner: Best & Co., New York.